Are You Keeping Useless Records? ..... Pg. 10

AIR CONDITIONING HEATING & REFRIGERATION NEWS
The Newspaper of the Industry
RESIDENTIAL — COMMERCIAL — INDUSTRIAL
February 29, 1960

Issued every Monday at 450 West Fort St., Detroit 26, Michigan
Established 1936
Member, Associated Business Publications (ABP) Member, Audit Bureau of Circulations (ABC)

Vol. 89, No. 9, Serial No. 1,614
Reentered as second class matter October 3, 1936, at the post office at Detroit, Mich., under the Act of March 3, 1879.
Subscription Price, $6 Per Year (U. S. and Canada). Foreign: $10.00 Per Year.
Trade Mark Registered U.S. Patent Office. Copyright 1960, by Business News Publishing Co.

Inside Dope

By GEORGE F. TAUBENECK

Learn to live and laugh — thus delay your epitaph

Civil War In Service Field
General Electric's Rebuttal
How About Consumer Costs?
Actual Case Histories
Component Time
Problems of Centralized Service
Embarrassing Moment
Closing Thoughts

Civil War In Service Field

Not since Joe Oberc put the bee on George Mason and Elmer Biechler has there been such a hullabaloo in the parts and service business.

What's it all about? Who are the contenders? The issue is: Are General Electric and RCA-Whirlpool overstepping the bounds of propriety by installing "factory" centralized service operations in major metropolitan areas?

ARW, representing independent wholesalers and service firms, plus NARDA (representing independent dealers) are on the attack. They charge that:

(1) Factory "centralized service" constitutes a monopoly; that the consumer has no choice;

(2) Under this policy, "official" service parts cannot be obtained by independents;

(3) "Centralized service" costs to the consumer are too high in too many cases.

General Electric's Rebuttal

In rebutation, G-E officials say simply that metropolitan dealers — particularly in the New York area — have fallen down on the service job.

Most of them don't even want to service, period.

For protection of users, a factory operation must fill the vacuum.

To check this at the local level we visited General Electric's Detroit branch (as reported in last week's "Dope").

Product service manager Harry Gensler reiterates that G-E parts are available to all—not only at the General Electric branch (6501 East Nevada Street)—but at the Servall Co., Ken Adler's jobber operation in Detroit and Flint.

Hench, no "monopoly," or stifling of cooperation with independent dealers and service

(Continued on Page 8, Col. 1)

'Contracting Out' Decision Seen as Vital

Labor Writers See Far Reaching Effect on Construction Industry

BAL HARBOUR, Fla. — The joint labor-management effort in the construction industry to cut down the effects of jurisdictional disputes, and to get big industrial plants to contract out the responsibility for maintaining and repairing their installations, can have far-reaching effects on the future of the construction industry, and on the labor movement.

That was the conclusion reached by experienced observers of the labor movement following the recent meeting here of the AFL-CIO Executive Council.

As reported in the Feb. 22 issue of the NEWS, the "contracting out" development angered UAW President Walter P. Reuther to charge that craft unions in the building trades were engaged in "union busting" activities. Reuther's principal

(Continued on Page 4, Col. 1)

Gov. Rockefeller Urges Mandatory Fall-Out Shelters

ALBANY, N. Y.—The State Defense Council has been urged by Gov. Rockefeller to approve his plan for legislation to make construction of fall-out shelters mandatory.

The proposal, which would involve substantial financial outlays for every property owner, envisions protection for all state residents against 99% of the danger from radioactive dust of nuclear explosions.

The plan coincides with one

(Continued on Page 25, Col. 1)

Shoddy Heating Jobs Hit

* * *

Toronto Association Asks Licensing of All Installers

TORONTO, Ont., Can.—In a drive to stamp out shoddy workmanship, the Warm Air Heating Contractors' Association will urge the province to approve establishment of a licensing system covering all persons installing heating and air conditioning equipment.

The association has asked Municipal Affairs Minister Warrender to prepare the necessary legislation to bring contractors in this field under the Metro Toronto Licensing Commission.

Metro now licenses wet-heat and plumbing contractors but requires special legislation to include warm air and air conditioning.

An examination board in this field "has been long past due and so vitally needed by the reputable warm air heating contractors in this area," the association states.

(Continued on Back Page, Col. 5)

Listed Among Glaring Causes of High Upkeep And Dissatisfaction

DETROIT—"Shoddy heating systems" gained the listing as No. 1 among the seven most glaring causes of dissatisfaction and high upkeep in U.S. homes which are being built in these times, in an article "A Good House Nowadays Is Hard to Find" published in the February issue of *Harper's Magazine,* one of the nation's oldest journals of commentary on the national scene.

Written by A. M. Watkins, a former editor of *House & Home* magazine, the article was also critical of builders for going the "cheapest way" in both design and construction of new homes; of banks and other loan appraisers for failing to give proper credit for good design and construction; to state and local officials, contractors, and unions for clinging to obsolete code restrictions; and to the

(Continued on Page 25, Col. 2)

Group In Dayton Area Seeking Tighter Inspections

DAYTON — Licensed heating contractors have called for an end to alleged haphazard methods of installing heating systems in Montgomery County.

The contractors, through the Heating, Air Conditioning, Sheet Metal & Roofing Contractors Association, asked county commissioners to tighten inspection procedures.

In most municipalities around the country, heating contractors are licensed or registered and are required to take out permits for each job, the association said.

"The situation in Montgomery County is the opposite," the association reported. "Anyone can install a heating system regardless of ability or responsibility."

The group suggested that commissioners require that a separate heating permit be obtained by the person or company involved in the installation project. It also suggested that the county contract with Dayton for inspection of the finished product.

BEHIND PAGE ONE . . .

- **Keeping Records**
  Are Some Dealers Wasting Money By Keeping Useless Records? 10
- **Performance of Finished Job**
  This Is What Does Real Selling Job and Assures Future Orders 16
- **Thermoelectric Modules**
  Ready for Industrial Cooling 21
- **Tech Center**
  Applied Electrical Theory (11) 22
- **What Was New In Dallas** 24

Whirlpool Bows Remote Control Cooler

LAS VEGAS, Nev. — A remote control room air conditioner was unveiled here recently by Whirlpool Corp. before some 600 key "RCA Whirlpool" dealer personnel assembled here from all over the country for a five-day combined business-pleasure meeting.

The company uses the words "dramatic development" and "revolutionary" in describing the air conditioner.

Available in 1-hp., 115 and 230-volt sizes, the new "Custom" unit bears no suggested list price, according to L. M. Larkin, general manager of Whirlpool's air conditioning division.

Both models will retail at a somewhat higher price than the eight standard operating 1960 Custom models introduced during a series of 21 national dealer meetings last fall, Larkin said.

Also shown for the first time were five new deluxe room coolers, available in 1 and 2-hp., 115

(Continued on Page 26, Col. 3)

Next Week: Air Conditioning 'Show Case' Issue

Specifications of all 1960 models of most makes of packaged air conditioners that have been introduced thus far this season will be published in the March 7 issue of Air Conditioning, Heating & Refrigeration News.

This "Air Conditioning Show Case Issue" will also offer a wide assortment of information on the market for air conditioning, and methods of promoting and selling the market.

A limited number of extra copies of the March 7 issue will be available on a first come, first served basis to those who order them. Prices will be 1-9 copies ($1 each), 10-49 copies (75 cents each), 50 or more copies (50 cents each). Reserve your copies by writing to Air Conditioning, Heating & Refrigeration News, 450 W. Fort St., Detroit 26, Mich.

25 Mfrs. Seek ARW Membership

CLEVELAND — Twenty-five manufacturers thus far have applied for associate membership in the Air-Conditioning & Refrigeration Wholesalers, association of independent air conditioning and refrigeration supplies and equipment wholesalers, it is reported by ARW headquarters here.

At its annual meeting last November ARW announced a change in its constitution which would permit manufacturer suppliers to be invited into the ARW as associate members. During the past month, 234 component manufacturers have been invited to join through a letter sent to them by William Miessemer, ARW president.

"We have been pleased by the interest shown by many manufacturers to join with us in association work," Miessemer stated in reporting the 25 applications for membership. "We had estimated that for the year 1960, perhaps 30 to 40 manufacturers would apply, but it looks like we were low in our estimate.

"The plans for committee activity with associate members will not be finalized until after

(Continued on Back Page, Col. 1)

Coleman Earnings, Sales Grow In '59

WICHITA, Kan.—The Coleman Co., Inc., reported 1959 sales of $41,257,335, a gain of $5,527,609 over sales in 1958 of $35,729,726.

Net earnings last year were $1,353,833 or $2.17 per share of common stock compared to profits in 1958 of $769,257.

All divisions of the company were credited by Sheldon Coleman, president, with having contributed to the upswing in sales and earnings.

The directors of the company, meeting here Feb. 16, declared a regular first-quarter dividend of 20 cents a share on common stock, payable March 10 to the stock of record Feb. 26. A preferred stock dividend of 53⅛ cents to stock of record Feb. 26 will be paid March 12.

Labor Row Hits Refrigeration Piping

BUFFALO — Regional Director Merle D. Vincent, Jr. of the National Labor Relations Board petitioned in U. S. District Court for an injunction to restrain Steamfitters Local 395 from picketing a Cheektowaga construction site.

The picketing has halted all work on the $100.000 milk processing plant of the Buffalo Milk Producers Cooperative Association.

The injunction petition stems from a charge of unfair labor practices filed by the Marshall Maintenance Co. of Trenton, N. J.

The company, which is installing piping for refrigeration equipment in the plant, alleges that the picketing is in support of the local's demands that the work be assigned to union members.

Vincent asked the court to restrain the union from picketing until final disposition of the jurisdictional issues and unfair labor practice charge is determined by the National Labor Relations Board.

Cost Control Improves Ansul's Earnings

MARINETTE, Wis.—Sales of Ansul Chemical Co. in the fiscal year ended Oct. 31 rose to $10.242,567 from $9,229,651 in 1958 and earnings climbed to $450.256, equal to $2.63 a share, from $139,298, or 81 cents a share, in the previous year.

Robert C. Hood, president, credited the company's improved performance, in part, to its ability to control costs.

No Rust on Iron Fireman

CLEVELAND—Sales in 1959 were the largest for a peacetime year in the company's history, it was reported by Lewis J. Cox, president, Iron Fireman Mfg. Co.

During 1959, the heating equipment and electronics concern had sales of $28,664,942 in civilian and military products, an increase of approximately 3% over the previous year.

Earnings, however, increased substantially to $749,305, or $2 per share on 373,486 common shares outstanding. These amounts compare with 1958 sales of $27,938,130 and earnings of $504,111, or $1.40 per share on fewer shares.

Iron Fireman has plants in Cleveland, Portland, Ore., and Toronto, Ont., Can. General offices are in Cleveland.

Forston Moves To New, Larger Plant

HOUSTON, Texas—The Forston Co. has completed moving into its new and larger plant at 2117-19 Judiway St. (Oak Forest) here, it was announced recently.

Credit for the recent expansion of office, factory, and warehouse space has been given to the "increased demand for and public acceptance of the Forston heat pumps."

The yearly increases in national sales volume effected as well an expansion of Forston's residential and commercial heat pump and air conditioning lines. The company said, it now has available two complete central lines.

Forston's residential line includes 2, 3, 4, and 5-ton models of packaged self-contained heat pumps and air conditioners and remote split system heat pumps and air conditioners.

The company's commercial line consists of 2, 3, 4, 5, 7½, 10, and 15-ton models. The packaged self-contained group includes special "roof mounting" models.

Forston's automotive line consists of dash and trunk models for all popular makes of American cars, and its "Continental Voyager" units for small and foreign cars of limited horsepower engines.

Claude E. Forston said: "All indications are than 1960 will be a very good year, with an even greater volume of heat pumps being sold. Our sales on central units are running about 95% heat pump, 5% straight cooling."

Auto Engineers Will Discuss Car Cooling

NEW YORK CITY — Recent developments in passenger-car air conditioning, heating, and ventilating systems will be discussed at a meeting of the Society of Automotive Engineers scheduled to be held March 15-17 in the Sheraton-Cadillac hotel, Detroit.

The meeting, which is expected to draw over 1,000 persons, will be held during National Automobile Week.

The session on "Comfort Control of Passenger Car Air" will be held Wednesday, March 16, starting at 9 a.m. A. E Kimberly of Chrysler Corp. will serve as chairman.

At this session, J. T. Kreasky, Chrysler Corp., will speak on "Controlling the Automotive Air Conditioner for Comfort"; W. H. Jackson, Harrison Radiator Div., General Motors Corp., will discuss "The Bodies In Which We Live"; and H. V. Joyce of Ford Motor Co., will talk on automotive heating.

Frick Picks Kiessling For Financial Post

WAYNESBORO, Pa. — Appointment of John R. Kiessling as treasurer and controller and a member of the board of directors has been announced by W. H. Aubrey, president of Frick Co.

ALCO'S *New* P.O.S.
CHILLER CONTROL
THERMO® EXPANSION VALVE

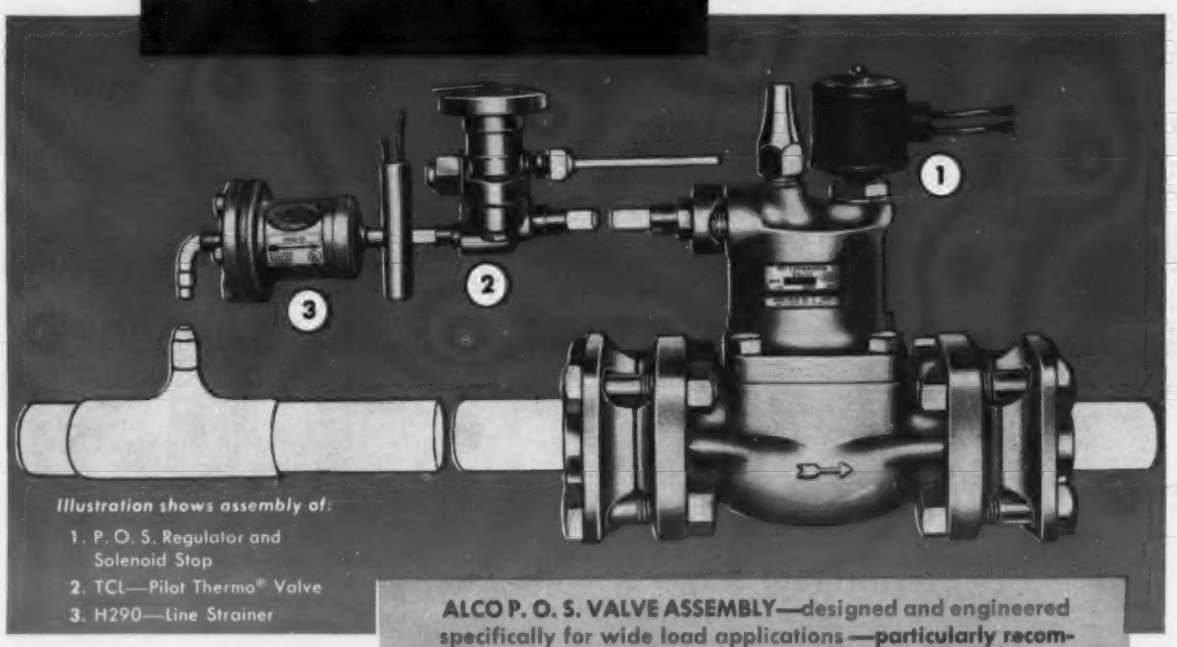


Illustration shows assembly of:
1. P. O. S. Regulator and Solenoid Stop
2. TCL—Pilot Thermo® Valve
3. H290—Line Strainer

Alco's New P. O. S. Valve is engineered with the Solenoid Pilot Stop Valve as an integral part of the P. O. Valve.

ALCO P. O. S. VALVE ASSEMBLY—designed and engineered specifically for wide load applications—particularly recommended for refrigeration systems having capacity reduction—the ALCO SOLENOID PILOT STOP VALVE insures positive liquid "Shut-off."

ALCO PILOT OPERATED THERMO EXPANSION VALVES—give a positive control to 15% of nominal capacity with minimum superheat.

ALCO LIQUID LINE STRAINERS—insure positive protection of working parts from solder and dirt.

Capacities: 20 to 200 tons
Refrigerants 12 and 22

For Specifications—
Call your Alco Wholesaler, or write

• *BUY SECURITY*
• *BUY QUALITY*
• *BUY ALCO*

8220

ALCO VALVE CO.
353 KINGSLAND AVE. • ST. LOUIS 5, MO.

The one complete line of refrigerant controls: Thermostatic Expansion Valves • Refrigerant Distributors Solenoid Valves • Suction Line Regulators • Flooded Evaporator Controls and Reversing Valves

Atomic-Fired Boiler

Miniaturization May Bring It for Smaller Applications Sooner Than Most Expect

PHOENIXVILLE, Pa. — Advances in miniaturization will bring the atomic-fired boiler to the smaller industrial, commercial, and institutional market "sooner than most of us realize."

So says Russell E. Emrich, Sr., president and general manager of Boiler Engineering & Supply Co., Inc., here, manufacturer of the Continental automic "package" fire-tube boiler.

Emrich feels that consideration of atomic energy as a boiler heat source now furnished by conventional fuels is not as visonary as it might seem. The custom-built atomic energy power plants of today all have central-station type heat exchange equipment designed by boiler manufacturers, it was pointed out.

"Boiler manufacturers are interested in three distinct avenues of approach to the use of atomic energy," Emrich observed.

"The first possibility is a vessel not unlike a present-day boiler in which the burner and furnace is replaced by a battery-like atomic charge.

"Because of the more highly developed central-station technology of atomic power generation, a second means of atomic energy utilization might be through replacing the burner and furnace of process and comfort heating boilers by some sort of electrical element in an electric boiler design.

"A third possibility is that heat from central atomic plants might be distributed much in the form of central district heating and some sort of liquid-to-water heat exchanger will become the boiler of the future."

Emrich feels that the boiler manufacturer will be responsible for the design of the pressure vessel utilizing the new atomic fuels.

Sydney Anderson Named By Airtemp To Head West Coast Branch

LOS ANGELES—Sydney Anderson has been appointed branch manager of Chrysler Airtemp's new West Coast air conditioning and heating branch by Joseph B. Ogden, vice president of sales.

Ogden announced the appointment in conjunction with his recent West Coast visit to the branch office-warehouse, located here.

Anderson has been with Airtemp since 1943, when he started as a field engineer. He was named general manager of the Packaged Heating & Cooling Dept. at Airtemp in 1958.

Janitrol Forum No. 6 Now Being Presented

COLUMBUS, Ohio — Forum Number Six of the Janitrol Institute of Dealer Management, covering "What To Do About Air Conditioning Sales in '60," is now being presented in 23 cities throughout the nation.

These one-day dealer meetings are being conducted by Ray Horan, director of the institute, and Tom Calhoon, manager of local advertising and promotion for Janitrol Heating & Air Conditioning, a division of Midland-Ross Corp.

Ray C. Moore Resigns Post at UsAirco

DELAWARE, Ohio — Ray C. Moore, a veteran in the air conditioning, refrigeration design, service, and construction business, announced that he has resigned as chief engineer of United States Air Conditioning Corp. (UsAirco).

In quitting the design business, Moore said he feels that his long experience "will fit better in the sales levels of the same industry." He added that he has serveral offers but will not make a decision until after he has had a rest.

Jesse H. Davis Dies, Fathered First Cooled Passenger Railroad Car

BALTIMORE — Jesse H. Davis, 85, who has been called "the father of the air conditioned railroad passenger car," died in Chevy Chase recently after a brief illness.

Davis retired as chief engineer of the Baltimore & Ohio Railroad's electric traction division 17 years ago. He is credited with designing and testing the first completely air conditioned railroad passenger car, which was put into service in 1930.

Air Conditioning Will Permit All-Year Use of Lincoln Center for Performing Arts

NEW YORK CITY—Thanks to air conditioning, all the concert halls and theaters at the Lincoln Center for Performing Arts will be in use 52 weeks a year.

The center, called by President Eisenhower "a mighty influence for peace," will include a new home for the Metropolitan Opera, Philharmonic Hall, the Juilliard School and chamber music-recital hall, dance-operetta theater, and repertory theater and library-museum. The latter will have a 100-seat theater designed specially for children's events.

Completion date set for the 14-acre center is 1964, but the New York Philharmonic is scheduled to move in by 1961. Designers of the air conditioned hall intend to build "the finest musical instrument in America."

The Metropolitan Opera's new home will have facilities it has needed for 50 years, and "air conditioning will make an extended season possible," according to a full-page pictorial ad in a recent issue of *The New York Times*.

Lincoln Center will be built and operated by a non-profit organization in the recently-cleared Broadway area between 62nd and 66th Sts.

NEWS readers are invited to write to the editor giving their opinions on any subject of interest to the industry.

B.A.C.

COOLING TOWERS
EVAP. CONDENSERS

NOW TO 700 TONS

in single factory-assembled units

COMPACT
QUIET
FIREPROOF
RUGGED
CENTRIFUGAL OR TUBEAXIAL FANS

Write for literature

Baltimore Aircoil Company, Inc. P.O. Box 7322, Baltimore 27, Md.

'Contracting Out'--

(Continued from Page 1, Col. 2)

opponent on the Executive Council is said to be Peter T. Schoemann, president of the United Association of Plumbers & Pipe Fitters, whose locals form a good share of the work force on air conditioning jobs.

The over-all importance of this matter was summarized in a report by well-known labor writer Victor Riesel. Since last April, says Riesel, a series of "summit conferences" of eight labor leaders and eight representatives of associations in the construction industry, and an impartial chairman in the form of a Harvard professor, have been held regularly in a labor-management effort to lower costs, introduce new machinery and materials, end all work stoppages, and keep peace in a massive business—the construction industry. These "summit talks" are the kind that the White House is attempting to start in other mass industries, says Riesel.

"This national effort is in a field which in the past has been hit by a billion-dollar-a-year cost springing from all sorts of jurisdictional strikes.

"At the summit meeting with the labor leaders are the top men in the Associated General Contractors, the National Constructors Association, and the National Association of Home Builders as well as specialty contractors such as Mechanical Contractors Association.

"Reuther is feuding with the group because it is campaigning against the use of Auto Workers—or Steel Workers and Oil Workers for that matter—as maintenance and repair men.

"It all makes for a loud conflict this year—and perhaps this decade."

Another specialist in the field of labor reporting, A. H. Raskin of the *New York Times,* declared:

"Dozens of tidy prescriptions have been evolved for keeping the peace between the bickering factions, but the only one that seems to prevail in the end is 'let George do it.' The George, of course, is George Meany, the Federation's president.

"By the next meeting of the AFL-CIO Executive Council in May, Meany will probably have hatched a new formula for the harmonious resolution of all inter-union disputes and everything will be cozily battened down—until the next roof-fall."

Contractors Elect Hotze

CINCINNATI — Vincent Hotze, Hotze Heating Co., has been elected president of the Mechanical Contractors Association here.

Former Distributor Charged with Fraud

CLEVELAND — Wilbert J. Baird, who had been president and founder of Baird-Foerst Corp., air conditioning equipment distributorship which went bankrupt in 1958, has been indicted by a grand jury here for larceny by trick and making false statements.

The indictment, prepared by the assistant county prosecutor, charges that Baird cheated the General Electric Co. and its credit affiliate of $23,428 in a 1957 financing deal. He allegedly used a phony invoice as security on a loan.

Baird's former partner in the distributorship, Harold Foerst, testified before the grand jury but was not indicted. He is now a salesman in Toronto.

Baird is reported to be living in Florida.

Cooling Distributors Sales Up 12% In '59, Inventories Fatter

WASHINGTON, D. C.—Sales of air conditioning and commercial refrigeration equipment distributors last year climbed 12% over 1958, according to the monthly wholesale trade report of the Census Bureau.

In December, the distributors' sales were 20% ahead of a year earlier and 5% better than a month earlier. Their end-of-month inventories increased 8% compared with a year ago but were 2% below their November level.

Sales of plumbing and heating equipment and supplies distributors in 1959 were up 13% compared with 1958. Their sales in December increased 8% compared with a year earlier but were off 12% from November. Their inventories at the end of December were 9% higher than on Dec. 31, 1958, but 2% less than on Nov. 30.

NLRB Acts Under New Anti-Picketing Rule

WASHINGTON, D. C.—Stuart Rothman, general counsel of the National Labor Relations Board, recently authorized issuance of a complaint and an application for a Federal court injunction to halt a union's picketing at premises of customers of an employer from whom the union is seeking recognition.

This is the first case in which picketing of a neutral employer was charged as a violation of the new recognition or organizational picketing provision of the Taft-Hartley Act which forbids picketing by a union not certified by the NLRB.

Such picketing is banned after 30 days when no petition for a board election has been filed. No such petition has been filed in this case.

Rothman's action was taken after investigation of charges filed on Jan. 11, 1960, by Post Sign Co., a Knoxville, Tenn sign manufacturer. The charges allege that Local 760, International Brotherhood of Electrical Workers, had violated the new amendment to the Taft-Hartley Act by picketing Post's customers in order to compel Post to recognize Local 760.

The act requires the general counsel to seek an injunction whenever a complaint is issued in such a case.

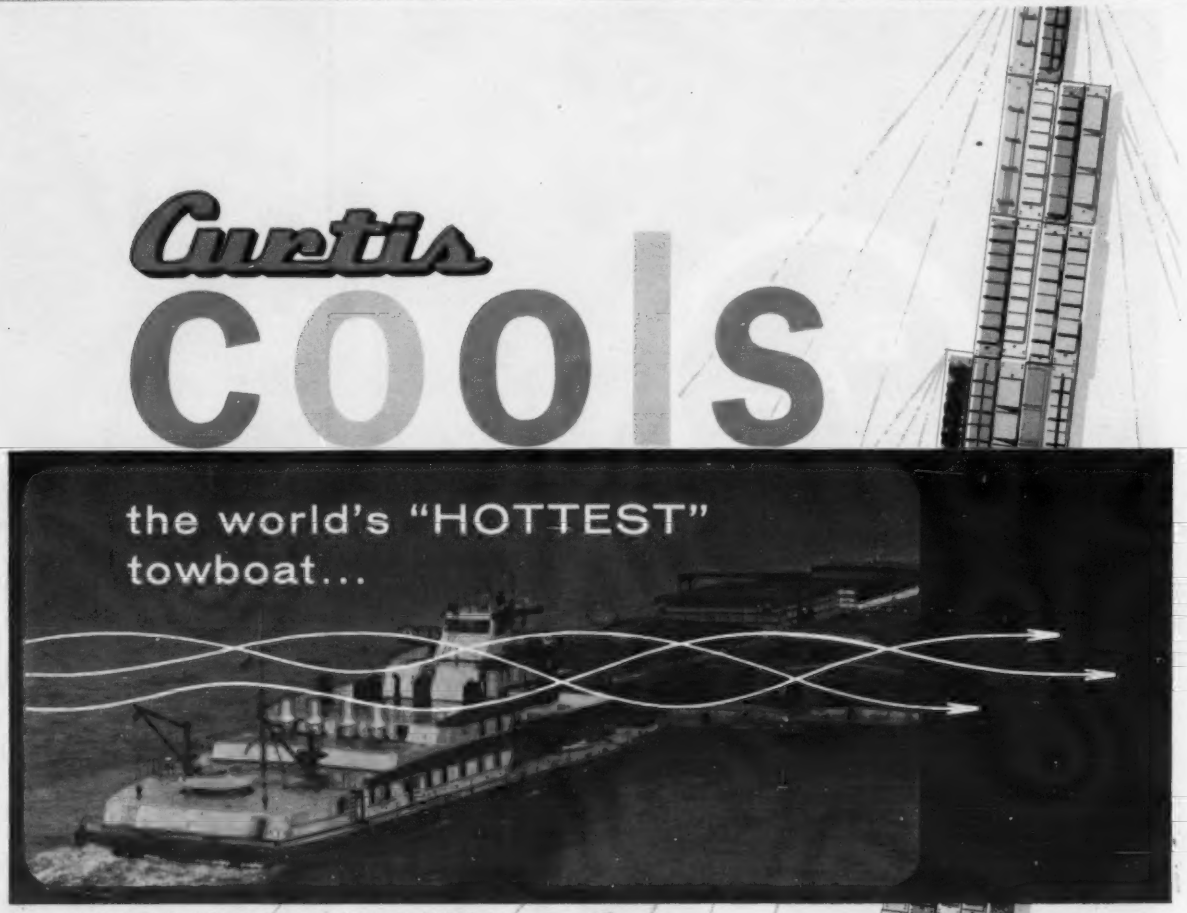
Moule Joins Temprite As Vice President

BIRMINGHAM, Mich. — George S. Moule has joined Temprite Products Corp. as vice president and treasurer.

His appointment lends direct emphasis to this company's long-range program of expansion and diversification, according to Lud Emde, president.

Moule had been director of sales of the Utica Div. of Curtiss-Wright Corp.; senior principal with the management consulting firm of Hall & Liles; and assistant director of manufacturing of Fruehauf Trailer Co.

Curtis COOLS

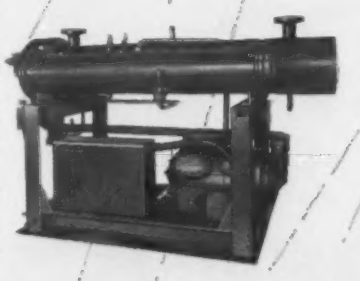


Huge 180 foot Federal Barge Lines towboat, the United States, has 50% greater horsepower than the largest towboat on the rivers. It can push 40 barges, totaling 1/3 mile, or 300 ft. longer than the "Queen Elizabeth".

C-96

Space saving design versatility? Easy installation? Operating dependability? Comparative cost? All these factors were considered by St. Louis Shipbuilding and Steel Company in the selection of air conditioning equipment for the world's most powerful towboat. The shipbuilders' and their design engineers' careful choice? A Curtis 20-ton packaged liquid chiller system. This equipment will cool the crew's quarters, galley, mess room, officers' and guest quarters—all with individual room or area temperature control.

Your selling job is easier when you sell Curtis—well-known installations and steady advertising have made your customers familiar with the completeness and dependability of the Curtis line. You can safely promise peak performance **always** up to, and frequently surpassing, rated capacity. Your profit on Curtis is the industry's envy . . . and the minimum service required on Curtis equipment keeps relations with **your** customers at their best.



THE COMPLETE LINE OF LIQUID CHILLERS • PACKAGED AIR CONDITIONERS • CONDENSING UNITS

Curtis MANUFACTURING COMPANY • REFRIGERATION DIVISION • St. Louis 33, Missouri

ESTABLISHED IN 1854

QUIK-OPENING®

PATENTS APPLIED FOR

LEWIN-MATHES
COMPANY
DIVISION OF CERRO DE PASCO CORPORATION
ST. LOUIS 2, MO.

3/4" TYPE K
60 FT. COIL

NEW
SEE FOR YOURSELF

COPPER WATER TUBE

SOFT TEMPER

MADE IN U.S.A.

1. PULL HERE
IT'S PERFORATED

IT'S PERFORATED

Why lose expensive minutes on the job struggling with hard-to-open Copper Tube cartons?

The new Lewin-Mathes QUIK-OPENING Carton is designed for convenient storage, taking up a minimum of space.

Tube type, size and length are shown on all edges as well as the face of the carton for easy identification.

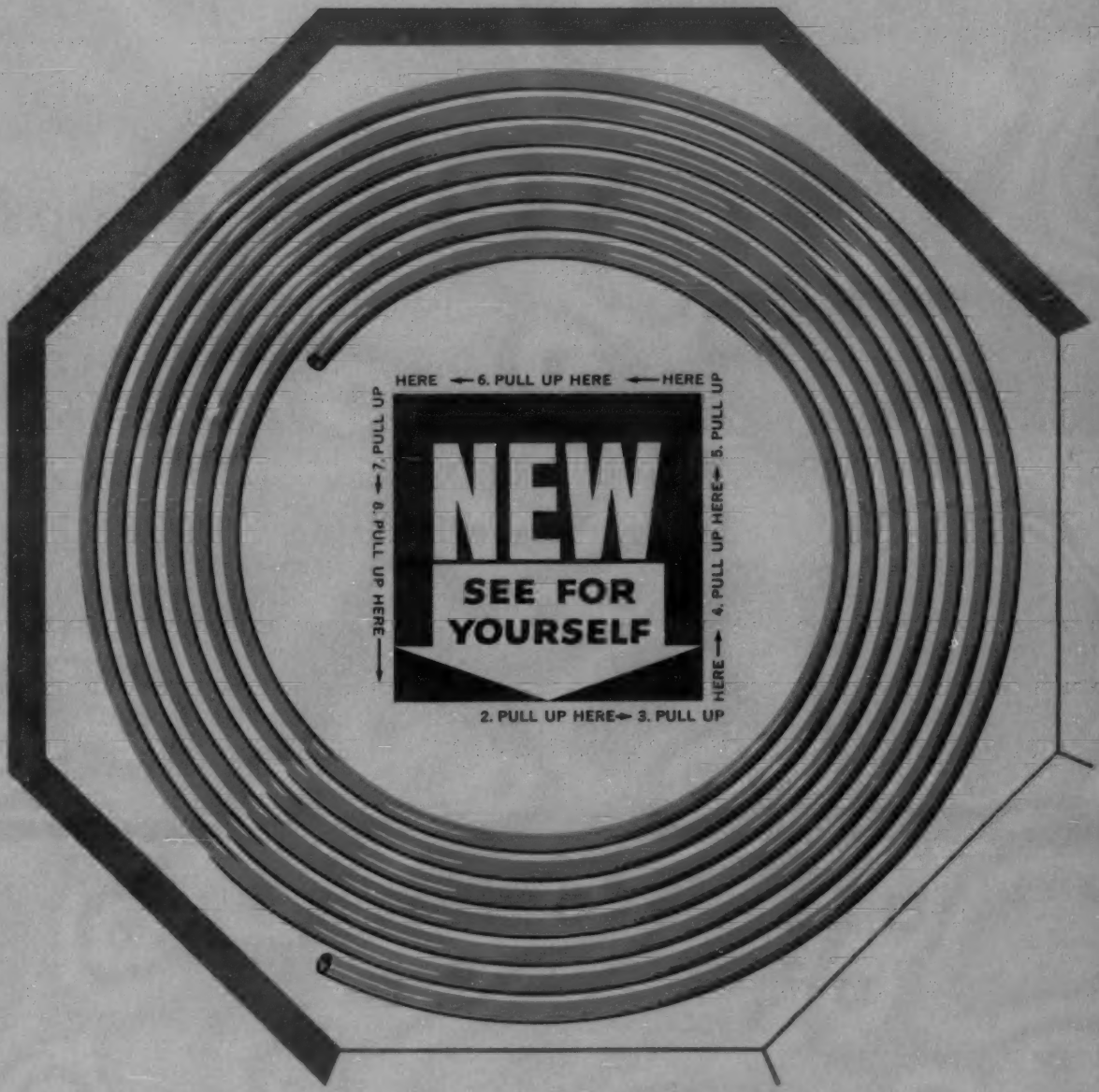
Protects against dust and moisture, too. The tube reaches you in perfect condition . . . every time.

Yet, there's no sacrifice of carton strength . . . no chance of the QUIK-OPENING breaking open in shipment.

There's no need to use a sharp edge . . . no chance of marring or damaging the tube.

See how QUICKLY and EASILY this sensationally new carton opens along the perforations!

SPECIFY LEWIN-MATHES COPPER TUBE. AVAILABLE NOW IN THE NEW QUIK-OPENING CARTON!


HERE
6. PULL UP HERE
HERE
7. PULL UP
6. PULL UP HERE
NEW
SEE FOR YOURSELF
5. PULL UP
4. PULL UP HERE
HERE
2. PULL UP HERE
3. PULL UP

As integrated specialists, Lewin-Mathes disciplines Copper to deliver it uniformly perfect as Lewin-Mathes Copper Tube. In 1950, Lewin-Mathes made Copper Tube easier to ship and store through the introduction of the HANDI-GRIP Carton, adaptations of which are in use throughout the industry.

Now, with the development of the sensationally new QUIK-OPENING Carton, Lewin-Mathes makes Copper Tube available in a package that's as convenient, trouble-free and time-saving as the product it contains. The Lewin-Mathes QUIK-OPENING Carton is truly a **disciplined** Copper Tube package.

NOW THE CARTON IS DISCIPLINED, TOO!

QUIK-OPENING... the first basic improvement in Copper Tube packaging since Lewin-Mathes originated the octagon-shaped "Handi-Grip" Carton, now adopted by most of the industry.

NOW THE CARTON IS DISCIPLINED, TOO!

Specify Lewin-Mathes Copper Tube in the QUIK-OPENING Carton for
Easy Opening • Sure Protection • Convenient Storage • Instant Identification

LEWIN MATHES

SAINT LOUIS, MISSOURI

MANUFACTURERS OF COPPER AND BRASS TUBE, PIPE AND ROD

Division of Cerro de Pasco Corp.

OHI Distribution Secretary Speaks

Oil Heat Dealer Must Face Competition, Points To Builder Subsidies as One Means

MINNEAPOLIS — "The individual dealer who sells oil heating and markets fuel oil is very well trained in specialized selling, and because of this can face competition."

Charles H. Burkhardt, national secretary of the Distribution Div. of the Oil Heat Institute of America, told this to members of the Northwest Petroleum Association at a meeting held recently by the organization in Minneapolis.

Tracing the growth of central heating with oil, Burkhardt said "only by the installation of oil heating equipment can the industry survive." By way of emphasis he added: "Not a drop of oil can be consumed for central heating without an oil burner."

Situation Not Analagous To Anthracite Decline

Stating that "The Anthracite industry decline in the home heating field over the years in the face of oil is in no way analagous to oil heat's present competitive status with natural gas." Burkhardt said anthracite coal faced a single competitor in oil whereas "oil is caught between the jaws of two competitors, and is presently in the vise between natural gas heating and electric heating."

He said when "the status of electric heating becomes strong enough to be the equivalent of the challenge of gas heating, the jaws of this vise will be equal in power and the squeeze will really be on."

The OHI official said "it is important that a program be worked out so that the general emergence of the industry involved in the sale and installation of equipment so vital to the increase in the future of the oil heating business will be achieved in an orderly fashion with some sort of decision, rather than the helter skelter method that is going on now."

He pointed to the efforts of the Western Oil Heat Institutes of Washington, Oregon, and Nevada in providing subsidies for builders as showing "intelligent direction."

'Enlist Neglected Segments'

He called on the oil heat dealer and equipment marketer to enlist as an ally "those segments it has neglected for such a long period of time, and through whom thousands of burners have been lost to gas. These are warm air heating contractors and the plumbing and heating contractors who do not sell oil."

Pointing out that "more than half of the producing oil and gas wells in the United States are owned by the same principals who own tme refineries and oil producing properties," Burkhardt said the very nature of this connection leads to a balance in the supply of the two home heating fuels, oil and natural gas.

The OHI Distribution Div. secretary said "it is inconceivable that a major oil company having an equal interest in both its children, heating oil and natural gas, would see one arrive at a position where it would completely imbalance the economic position of the other." He pointed out that no such economic situation had ever existed in the coal industry.

The interest the major oil companies have in the heating oil industry is manifest, Burkhardt continued, when one looks at the number of major oil companies which are buying substantial independent heating oil businesses every day and extending their services direct to the public on a retail level.

"It is unreasonable," he argued, "to think the 'majors' would be investing such large sums buying up heating oil businesses if they saw no future for the industry. Their very actions show that the heating oil business has a long-range, substantial, and profitable future."

He indicated that some type of balance between heating oil and natural gas is to the interest of all who distribute the two fuels; otherwise enforced maintenance of a specified balance could come from the Federal government as a national defense and security measure.

Though the production and marketing conditions between oil and natural gas are unlike those between coal and oil, Burkhardt emphasized, however, that there is no basis for complacency of oil heat dealers, jobbers, and distributors.

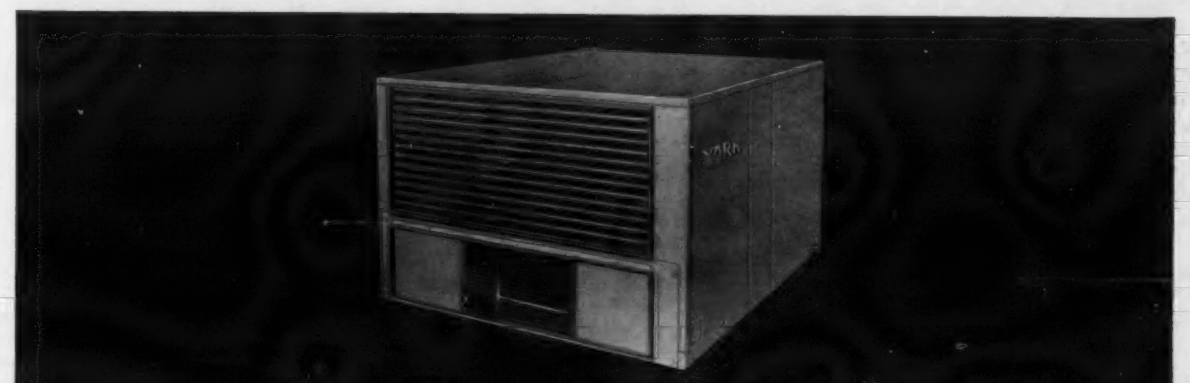
"The fickleness of public tastes and desires can sometimes offset the most well laid plans of mice and men," the OHI official cautioned. "For this reason," he said, "dealers must maintain vigilance in the form of promotion and advertising, improved company relations and performance with the public, at all levels. And they must show an increasing interest in the participation of sales and installation of equipment as well as the service to users."

Burkhardt said the recent program instituted by the major oil companies to produce better and more advanced oil burners should be "of especial interest" to the heating oil distributor.

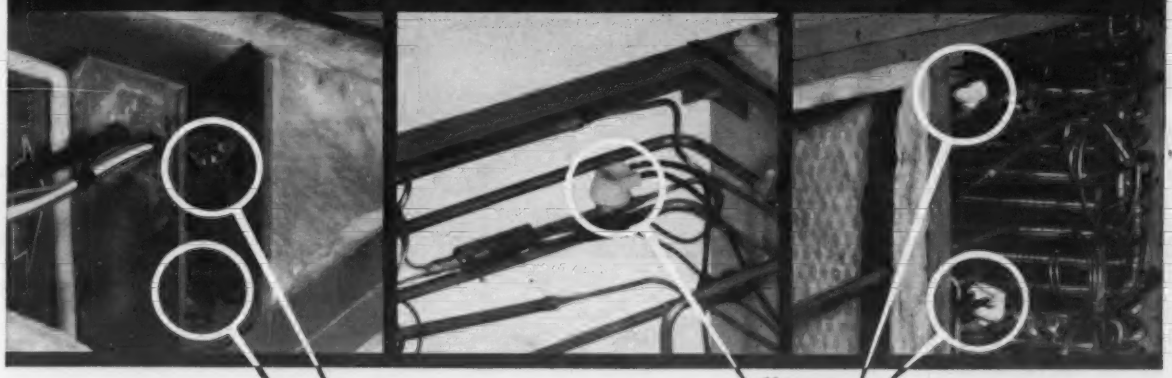
He predicted that this interest by the "majors" plus the interest shown by the independent distributors, who have set up their own research group to develop newer burners, will put oil burners on the market within the next five or six years substantially different from anything conceived before.

He warned fuel oil dealers and jobbers not to be discouraged by statements of "arm-chair strategists and those statisticians who pluck estimates out of the air without proper sampling," asserting that these estimates are often based on pessimistic opinion rather than facts garnered through experience.

"Statistics must often be modified by judgment and experience which can only be obtained through constant travel and many contacts in the field, as well as through years of experience in close union and contact with a great number of oil heating operations."



Five Klixon Thermostats
team up on York Heat Pumps
to assure efficient and safe operation



2 Klixon 20400L Thermostats are used to limit temperature of two supplementary heaters.

A Klixon 20220 Thermostat controls a small heater element of the flow-modulator.

2 Klixon 20221 Thermostats are mounted on the liquid line and shut down the unit on blocked blower.

Warmth indoors from zero degree outdoor temperatures or natural cooling in 115° ambients with one compact unit . . . that's what the York Heat Pump provides for homes or businesses.

In designing their versatile heat pump, York engineers specified *five* KLIXON Thermostats in each unit. The reason . . . their experience proves rugged KLIXON Thermostats insure accurate temperature control and dependable, service-free operation.

York also uses KLIXON Thermostats on three types of attic-installed central heating-cooling units, both unit switch and reverse-cycle models.

These controls are available in both sealed and open construction in many types and sizes. Fixed temperature settings are custom calibrated at the factory to meet specific application requirements.

M & C field engineers will help you make test applications of KLIXON Controls at your request. Send for KLIXON Commercial Thermostat Catalog.

SPENCER PRODUCTS

TEXAS INSTRUMENTS
INCORPORATED
METALS & CONTROLS DIVISION
2402 FOREST STREET • ATTLEBORO, MASS.

Spencer Products: Klixon® Inherent Overheat Motor Protectors • Motor Starting Relays • Thermostats • Precision Switches • Circuit Breakers

Inside Dope

By GEORGE F. TAUBENECK

(Continued from Page 1, Col. 1)

firms, would appear to be discernible.

How About Consumer Costs?

There remains the ticklish question: Does centralized service cost the consumer too much?

Harry Gensler maintains that the average dealer loses money on service because he doesn't know his own costs.

Ideally, he postulates, there should be a 400% markup on labor charges. Thus, if you pay a repairman $3.00 an hour, you should charge the customer $12.00 an hour.

Here's how he figures it: half the repairman's time is spent in transit, again as much time is spent in idleness between calls. And, another 100% markup is needed for office overhead.

He admits that he doesn't always achieve this "ideal," but he advocates it in sessions with other servicing organizations.

We are pleased to report that his firm stages a great many educational meetings for outstate dealers and competing service firms.

Actual Case Histories

"I wish I could get prices like that," reacted George Johnston, when we relayed to him Gensler's 400% markup theory.

Johnston, an independent, runs a bigger organization than the G-E branch. The latter has 42 trucks. Johnston trades in that many trucks annually, we've been told.

His company answers service calls 24 hours a day, seven days every week, over nearly all downstate Michigan.

George (who buys real estate just to find more holes in which to bury the profits he can't spend) charges six dollars for the first hour—including travel time; and $1.75 per hour for each additional 15 minutes on the job.

He pays his men $3.20 an hour including fringe benefits).

An almost equivalent formula is followed by Refrigeration Service, Inc. of 11111 Grand River, Detroit. This is one of America's best independent service organizations.

Buck Downer of this outfit charges $8.70 for the first hour, and $1.60 for each additional quarter-hour on the job.

Neither Downer nor Johnston report consumer complaints about their prices. Nor are they complaining themselves, financially, about anything except high taxes.

Component Time

The G-E formula is different, and more complicated. They *don't* charge travel time. They *do* base labor charges on "average component time."

What does this mean? Roughly, a fixed fee based on the average number of minutes it takes to repair a certain "area" of the product.

Somehow or other it works out to equal six dollars for the first half hour, and three dollars for each subsequent half hour on the job.

Problems of Centralized Service

Gensler's organization covers the entire lower peninsula of Michigan. Factory branches are located in Flint, Grand Rapids, Saginaw, and metropolitan Detroit.

In the Detroit area alone they handle 90,000 calls (radio-dispatched) per year. Unfortunately these calls are spaced unevenly and uneconomically. Twice as many must be accommodated in June, for example, as in March.

Yet, steady employment of the staff must be maintained for two reasons:

(1) If you "lay off" you lose good men to other employers and occupations;

(2) Investment in each man amounts to a tidy sum; to find and train replacements becomes more expensive every year.

Here's how the G-E branch in Detroit tries to solve this dilemma:

Seasonally idle competent mechanics educate servicemen employed by (1) dealers who do maintain service departments, and (2) independent servicing organizations in "slack times."

These instructors travel to small towns, or conduct school classes for dealers and independents in middle-size communities.

In sum, G-E's Detroit branch service philosophy appears to be on the up-and-up.

Embarrassing Moment

Many, many years ago a newspaper headline tickled our funnybone. It read:

GOVERNOR TO
PUSH HIGHWAY

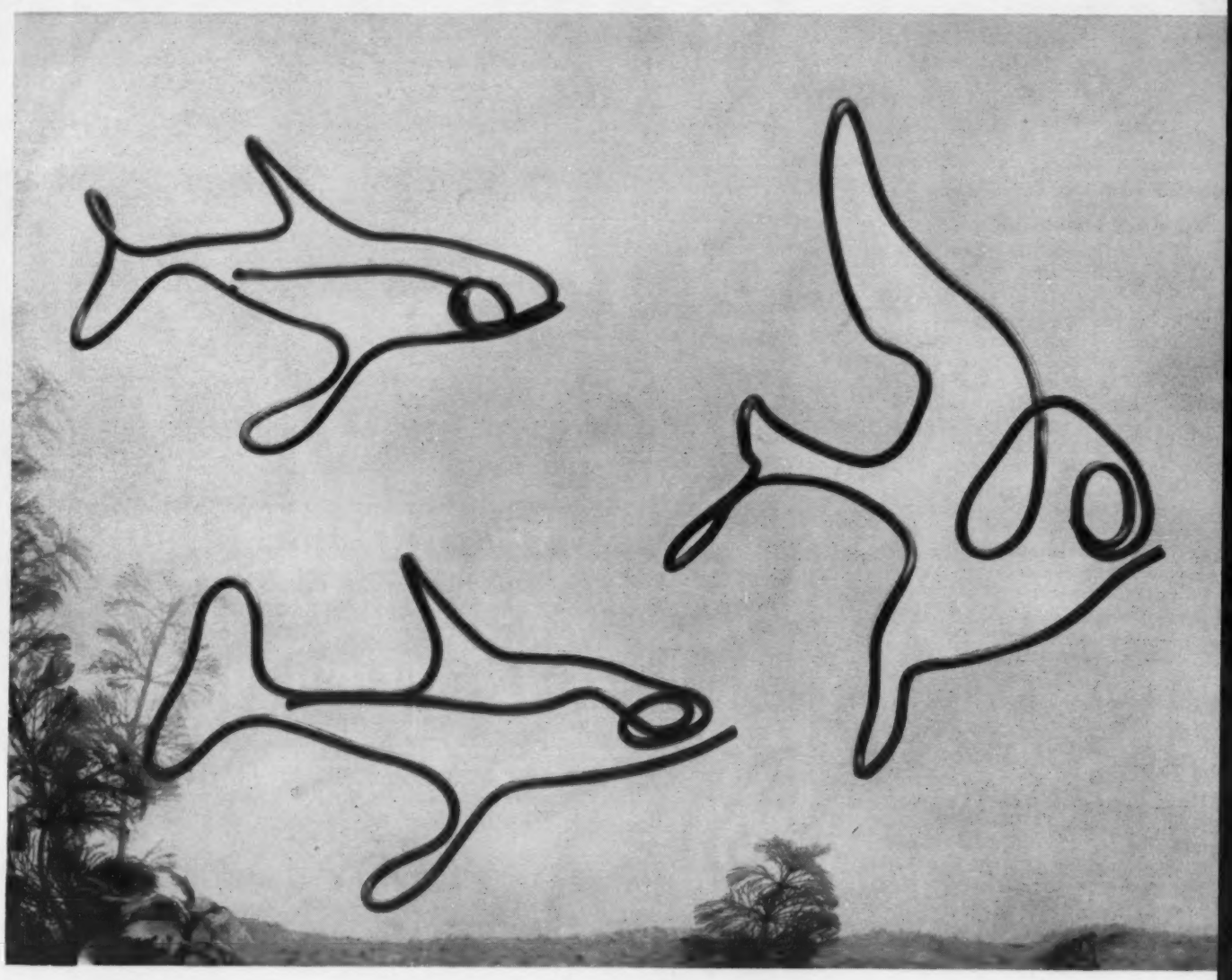
Ever since that delightful moment we have pursued, as a harmless hobby, the collecting of humorous newspaper "boners."

Readers of "Dope" send them to us from all over, and the better boners we receive from subscribers appear in this column frequently.

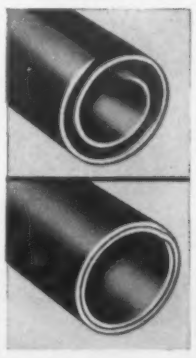
Alas! or goody! — depending upon your point of view — five subscribers have sent us this blooper clipping from AIR CONDITIONING, HEATING & REFRIGERATION NEWS:

"According to city policy, the accident occurred as Laurie was backing his car out of a driveway at the plant."

Wrote the President and Gen-



There's almost no limit to the things Bundy can mass-fabricate



Bundyweld is the only tubing double-walled from a single copper-plated *steel* strip, metallurgically bonded through 360° of wall contact for amazing strength, versatility.

Bundyweld is lightweight, uniformly smooth, easily fabricated. It's remarkably resistant to vibration fatigue; has unusually high bursting strength. Sizes up to ¾" O.D.

When it comes to mass-fabricating steel tubing into complex shapes, the folks at Bundy® are specialists. Whether it's condenser tubes, compressor parts, freezer shelves or dryer strainer tubes (as shown at right), chances are Bundy can fabricate it better. Here's why:

Bundyweld® Tubing is the safety standard of the refrigeration industry—double-walled from a *single* strip of steel, copper-brazed throughout, to make it leakproof by test. Covered by ASTM-254 and Govt. Spec. MIL-T-3520, Type III.

Bundy designers await your call, at *any* stage of product development. Perhaps they can suggest a new "twist" that'll save you time and money in manufacture.

Bundy specialists can mass-fabricate parts to your specifications on Bundy-designed fixtures and machines. The unit-cost is low . . . the quality high. Got a tubing problem? Better see Bundy *first!* Phone, write, or wire Bundy Tubing Company, Detroit 14, Michigan, today.

WORLD'S LARGEST PRODUCER OF REFRIGERATION TUBING

eral Manager of one of the biggest firms in our industry:

"Caught you with your plants down, George. Glad that accidents aren't city policy where we live."

Closing Thoughts

Definition of a model wife: While hoeing weeds out of the garden, she always picks up the fishing worms and saves them for her husband.

Life is easier to take than you'd think. All that is necessary is to accept the impossible, do without the indispensable, and bear the intolerable.

There may be no fool like an old fool, but some of the younger generation seem to be doing a pretty good job. — VESTA M. KELLY.

The difference between the right and the almost right word is the difference between lightning and the lightning bug.—MARK TWAIN.

An old-timer is a man who can remember when a businessman spent his time trying to corner the market instead of his secretary.—DAN BENNETT.

Aubrey E. Freshman Dies

ATLANTA—One of the four men who developed the early G-E refrigerator, Aubrey E. Freshman, died here recently.

Freshman, who was 77, had lived in Atlanta.

Gibson Sales Double

GREENVILLE, Mich. — Reporting that January sales of Gibson products were more than double January sales of a year ago, C. J. Gibson, Jr., president, Gibson Refrigerator Div. of Hupp Corp., said room air conditioners showed a 50% gain.

Mobile Demonstrator Proves a Natural For Promoting Conditioners for Trailers

MIAMI, Fla.—The Miami Ice Machine Co. reports remarkable success in selling air conditioning units for mobile homes by taking its demonstration unit to potential customers.

Says Morton Levine, president of the company:

"There is no selling method to compare with letting the prospect feel and see what we are selling. Our mobile air conditioned demonstration unit has met with terrific reception when we have taken it to trailer parks and invited the public to view and feel the equipment in operation."

Using a mobile home "Weathermaker" specially designed by Carrier for trailers, the demonstration trailer features this compact cooling unit which "takes up no more room than an ordinary end table." In fact, the demonstration shows how the unit may be used as an end table.

Full-page newspaper advertisements are sometimes used to announce the location of demonstrations. Refreshments and souvenirs are also offered as drawing cards.

Many sales are accomplished at the time of demonstration, and others are made by following up appointments made with prospective buyers, according to Levine.

When the demonstration trailer is not in use, it is parked next to the company sales room at 1829 W. Flagler St., and often attracts visitors who are interested in home as well as mobile air conditioning equipment.

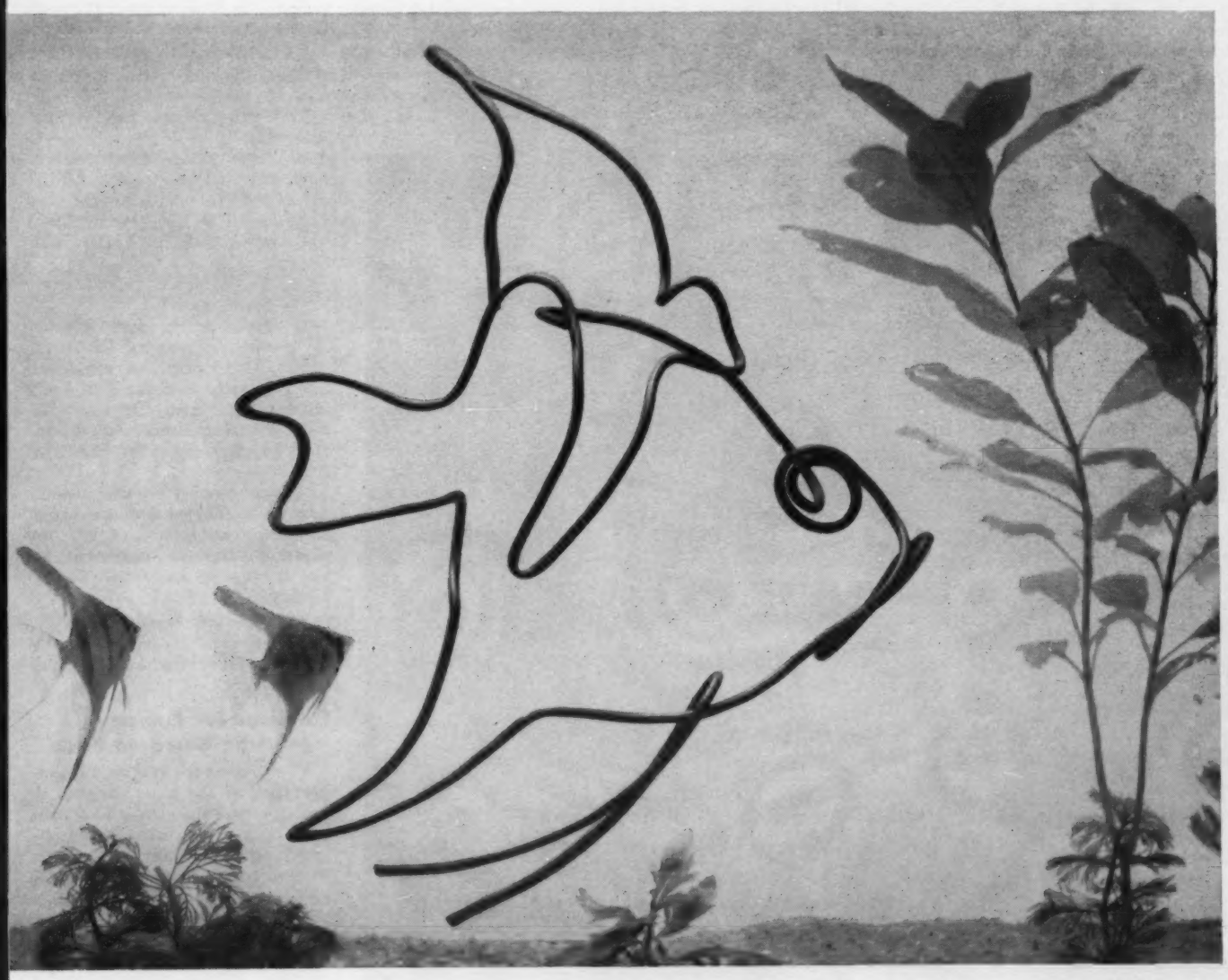
CABRA Contest Closes March 31

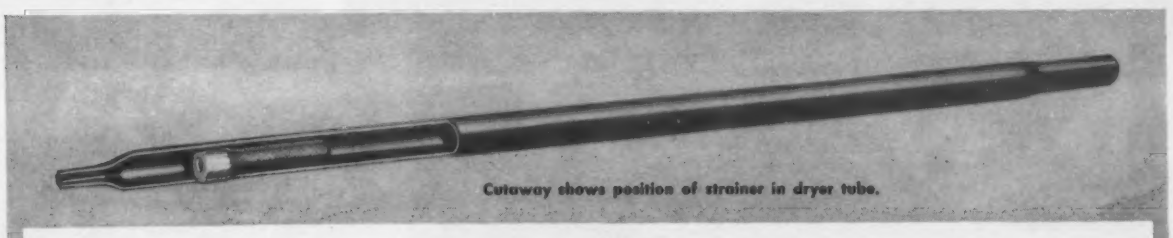
NEW YORK CITY—Inauguration of the second annual competition to honor the year's most outstanding contribution to the use, application, or metallurgy of copper and copper-base alloys has been officially announced by the Copper & Brass Research Association.

Winner of the 1960 competition will receive $1,000 and a bronze award to be presented May 17 at the association's annual meeting in Hot Springs, Va.

Nominations for the 1960 award competition should be mailed to the association no later than March 31, 1960. Entry forms with complete information are available from the Copper & Brass Research Association, 420 Lexington Ave., New York City 17.

REPRINTS
SELLING FOR PROFIT.
By Frank Klein—Only $1.00 ea. Clip this ad and mail with your name and address to: Air Conditioning, Heating & Refrigeration News, 450 W. Fort St., Detroit 26, Mich.




Cutaway shows position of strainer in dryer tube.

"11 inches of life insurance" . . . that's how Hotpoint describes this refrigeration dryer tube. Filled with synthetic zeolite, it absorbs the slightest trace of moisture to protect the refrigeration system from failure. The tube is made from ⅜" O.D. x .028 Bundyweld. One end is reduced slightly for silver soldering, while the other is reduced to .080 I.D. in less than ⅝".

There's no substitute for the original

BUNDYWELD® TUBING

WORLD'S LARGEST PRODUCER OF SMALL-DIAMETER TUBING • AFFILIATED PLANTS IN AUSTRALIA, BRAZIL, ENGLAND, FRANCE, GERMANY, AND ITALY

BUNDY TUBING COMPANY • DETROIT 14, MICH. • WINCHESTER, KY. • HOMETOWN, PA.

Do Some Dealers Waste Money By Keeping Useless Records?

By Bill Adams, Heating & Air Conditioning Research & Development Assn.

Editor's Note: The article that follows is perhaps one of the best summations we've ever seen of how and why business records should be kept (and not kept) by dealers and contractors in the air conditioning, heating, and refrigeration industry. Careful perusal of this analysis may suggest valuable changes to management or confirm their present methods of record-keeping.

We have found in recent months, while working in the offices of our individual members, an alarming lack of understanding by the owners and managers of the need for—and the uses of—good record-keeping systems.

Many of our dealers fail to understand, first of all, that the reasons for keeping records are diverse and often-times conflicting.

They are bombarded by demands for more information which, in turn, requires more or better records. Where will it all stop? Why must the manager today devote more and more time to "paper-work" and less and less time to the task of getting the jobs out? What reasons could anyone possibly give for burying their business under a mass of records?

3 Basic Reasons For Keeping Records

Nearly all record-keeping reasons fall into a very few categories. In fact, as we see below, there are basically only three, namely:

(A) *To comply with the law.* (To pay taxes, minimum wage requirements, etc.)

(B) *For information as to equity interests.* (To report to owners and stockholders, creditors, and suppliers.)

(C) *To aid management.* (Decision making.)

Many of our member firms, failing to realize these needs and uses, keep bulky time-consuming records which often do not adequately meet their needs. Even though they spend considerable time and money to maintain their records, when they seek information it is not there simply because the records where not designed to supply all their needs.

What records should a firm keep? Are there sound principles and fundamentals that can improve the record system and thereby supply the needed information while keeping the costs to a minimum?

First, we will look at how the firm can improve its records and why the improvement is needed, and second, we will look at exactly what is needed in the way of filling these needs.

(A) To comply with the law. There is very little the individual firm can do in this area. The requirements for information are specified by statute and must be compiled with to the letter. The important consideration here is the elimination of duplicate records.

Often a record is designed to meet the requirements of law. Later the manager may require a new record to serve a different purpose. Then when the new record is instituted everyone forgets to discontinue the old inadequate record.

The records needed are simply, factual records which can be easily verified.

(B) To inform the Equity Interests.

(1) Owners and stockholders, both real and potential, need information to measure the return on their investment. They are interested in only two things:

I. The safety of their investment, and

II. How much their investment is earning for them.

(2) Creditors and suppliers are primarily interested in first, whether the firm can and will meet its obligations and second, the growth potential of the firm.

About the only records needed here is a factual balance sheet to show the safety of the investment and a statement of the profits to show the ability to pay.

(C) To aid Management. Management needs records for only one reason: To make decisions.

Decisions for Future Must Be Based on Facts

Few managers realize the importance of the time element in decision-making. Decisions concern only the future, facts concerns only the past. A decision cannot be made about the past and facts cannot be based on the future. But a decision for the future must be based on facts about the past. The wisdom of the decision about the future depends entirely on the validity and adequacy of the facts about the past.

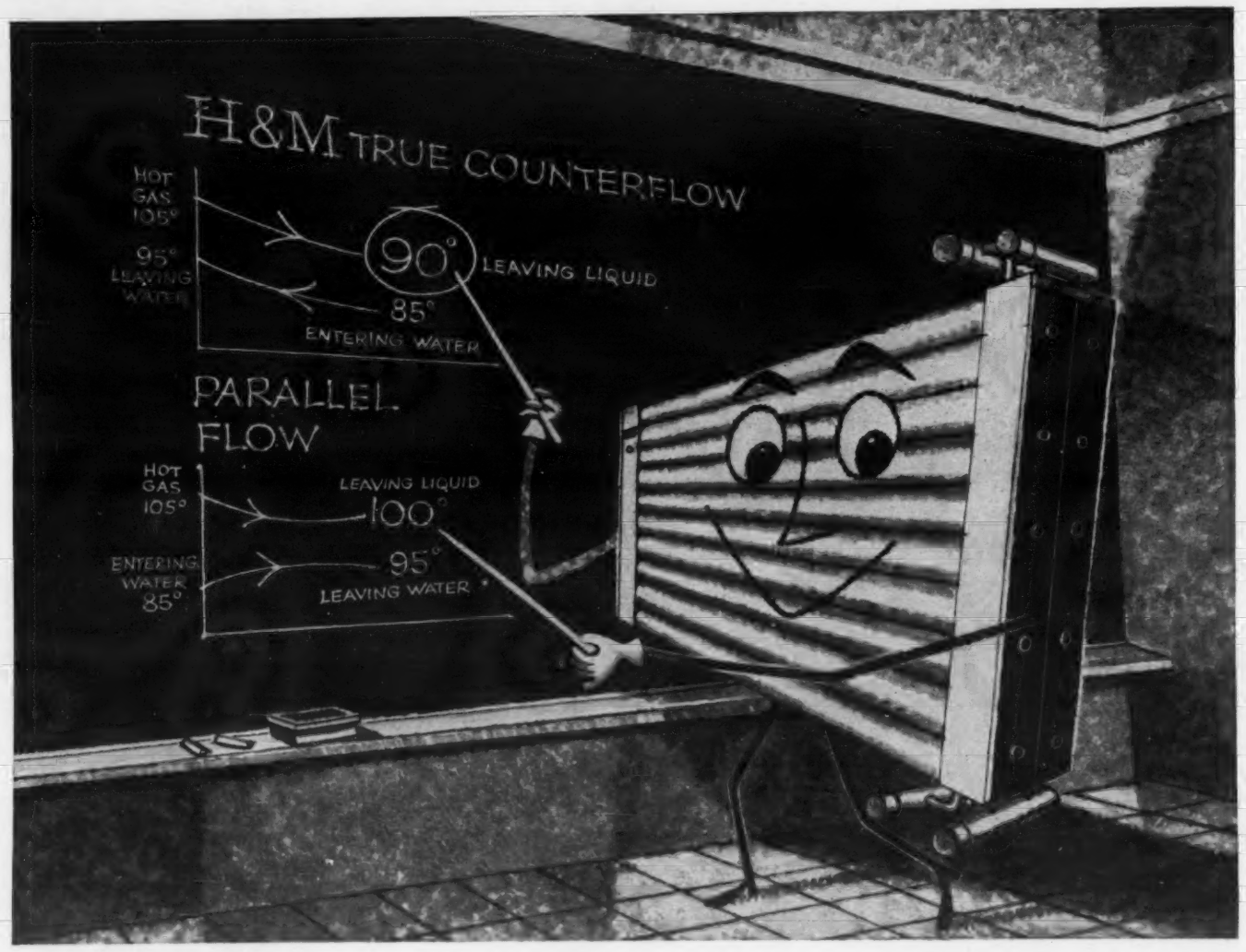
What are the decisions that management must make? What facts do they need to make these decisions?

To examine the decision-making process we first must know what a decision is. A decision is a process for choosing the best possible way to solve a problem. If Mr. X has a problem in his business, he first decides the importance of the problem. Can he afford to continue ignoring the problem?

Next, he must determine all possible solutions for the problem. Then, we can conclude, he has but to choose the best of the possible solutions. This is decision-making; merely choosing between two or more alternatives.

Now we should look at a few situations which require active decisions. And, we must remember, all situations require some decision. We can actively

(Continued on Page 13, Col. 1)



BEFORE YOU BUY, THINK:

Will you get adequate subcooling from your condenser?

You will if it's an H&M water-cooled condenser with true counterflow heat exchange

In Halstead & Mitchell water-cooled condensers the refrigerant and cooling water are introduced in true counterflow, as shown in the chart. Test results indicate an average of 15 degrees of subcooling in H&M condensers. Liquid refrigerant leaves at a lower temperature and system capacity is increased about ½% for each degree of subcooling without additional power input.

H&M condensers feature double-tube design, seamless copper tubing, brass headers. End plates are easily removed for quick, safe, *mechanical* cleaning. Water tubes are generously sized for low pressure drop and minimum maintenance. Available in ½ to 25 ton capacities, condenser types are Standard (½" and ⅝" O.D. water tubes), Heavy Duty (⅝" O.D. water tubes), and Sea Water (⅝" O.D. cupro-nickel water tubes), and are U/L approved. Order them from your refrigeration wholesaler and use them singly or on racks. Halstead & Mitchell, Bessemer Building, Pittsburgh 22, Pa.

H&M WATER-COOLED CONDENSER WITH TRUE COUNTERFLOW

HM Halstead & Mitchell

Water-Cooled Condensers • Cooling Towers • Air-Cooled Condensers • Finned Coil Products

"5th DEGREE" TESTING AVOIDS REJECT "RAPS." You can't pin a reject-causing rap on this compressor. Like all Bendix-Westinghouse compressors and condensing units, it was completely checked out at the factory. Five separate operating tests were made—suction pressure, head pressure, low-voltage operation, over-all performance and efficiency. Sure, it takes extra time to make these checks, but it pays off by eliminating line rejects for our customers—by as much as 75%. Why not look at the details of a new Bendix-Westinghouse condensing unit of compact design appearing on the back of this page and see how it makes possible less first cost, less operation cost and more refrigeration space.

Bendix-Westinghouse MOTOR COMPRESSORS

NEW BENDIX-WESTINGHOUSE CONDENSING UNIT LETS YOU DELIVER LESS FIRST COST, LESS OPERATING COST, MORE REFRIGERATION SPACE

Manufacturers of beverage coolers, vending machines, water coolers, dehumidifiers, and other general commercial-type cooling equipment will welcome this newest Bendix-Westinghouse development!

The Bendix-Westinghouse Model BYCH25 ¼-h.p. Condensing Unit is ideal for low-cost, high-volume applications. Its compact design permits refrigerated compartment space to be increased to give more cold capacity area in standard-size cabinets.

The secret of this new refrigeration advance?

The new Bendix-Westinghouse "Oval-Line" motor compressor—latest improvement in compressor engineering. The motor is of two-pole design, which means lighter weight, smaller size and lower cost.

The BYCH25 also has new and better motor insulation, inherent overload protection, full suction gas cooling, positive pressure lubrication and glass terminals, all of which contribute to a longer, more dependable operating life.

If you use fractional-horsepower compressors or condensing units in your manufacturing operations, it will pay you to get *all* the facts on the *new* Bendix-Westinghouse BYCH25—latest and best news in condensing units. Call or write direct.

Bendix-Westinghouse

EVANSVILLE, INDIANA

A Division of Bendix-Westinghouse Automotive Air Brake Company, Elyria, Ohio
Export Sales: Bendix International, 205 E. 42nd St., New York 17, N. Y.

Keeping Unnecessary Records--

(Continued from page 10)

choose between the possible solutions or we can passively choose to continue to ignore the situation:

(1) Pricing policies. Here management has two alternatives:

(A) I may adopt cut-throat tactics. For this alternative the firm ignores costs and good salesmanship. It merely watches its competitors and prices below them. Needless to say this firm never knows how much they made or lose on individual jobs until the job is completed —or more likely until the end of the year.

(B) The other alternative in pricing is to sell every job on its own merits. The firm ignores its competitors and gets out and sells its product. It bases its price on the cost plus a fair markup. This firm knows how it will fare on each job and can adjust to external changes as they occur, not months later when it is too late.

Good Job-Cost System Pays for Itself

The records needed in the first alternative are practically none. There will be little profit, and all the firm can do is hold on and hope for a miracle (which never happens). In the second alternative, records must be kept which will reveal in advance how much a given job will cost. A good job-cost system must be used and it almost always pays for itself with higher profits.

(2) The most "profitable" department.

The manager must constantly decide which departments are most profitable and exactly how far he should go in shifting emphasis within the firm toward these more profitable departments. At times the manager must decide whether to add a new department or drop an old one but usually the issue is not so clear-cut and well-defined. Normally, the decision is made in day-to-day planning of sales campaigns.

The records needed for this decision are designed to separate the revenues, costs, and expenses. Most firms feel this extra effort is too expensive and make their decisions on hunches and guesses.

(3) The most "profitable" job.

Management, by doing some study, can determine which jobs are most profitable and the reasons therefore. By segregating all jobs into "profitable" and "unprofitable" the general characteristics of each type can be determined.

Individual job cost records are a must for an intelligent decision on this question. Most of our dealers are now keeping individual job cost records, but in most cases they are not summarized and are seldom utilized for decision making.

(4) A new line, shop, or department.

For a new venture a firm must have informative records. The "company personality" enters every strongly into this problem.

By measuring the success or failure of the company on individual jobs of similar nature and these *causes* therefore, a great amount of the most valuable information can be had. Information which, by the way, can be obtained in no other way. Only the records of the company involved, showing success and failure on each type of job, in each department, and in each line or product, can be of any *real* value.

The records needed, of course, are good cost records "tailor-made" to the individual company. The company cannot be molded to fit a system, as many accounting firms believe, but the system must be molded to fit the company. When this is accomplished success in getting the needed information is the inevitable result.

(5) Machine Replacement Policies.

In this, as in most business decisions, the choice must be made by comparing the *costs* of two alternatives.

The big question is, of course, which costs do we compare? Do we compare all costs of both or only those costs which will apply to future operations? This is the key to solving the whole problem. By comparing the differences in the costs of the two alternatives over future periods of operations we readily see the wiser course.

(An example: Suppose the XY Co. is considering buying one new machine that will replace two old machines. Costs which they *must* compare are:

(A) Material. Quantity discounts, uses of cheaper substitutes, volume of waste, and defects (or seconds).

(B) Labor. Wage rates, number of operators, supervision required, and availability of labor.

(C) Original Costs and Depreciation. All costs and depreciation of the new machine *only*.

(D) Other Costs. Power or fuel, maintenance and repair, and special costs such as housings, covers, guards, etc.

The records needed here are good cost records showing material actually used (not material purchased); amounts of waste; labor actually used (as opposed to idle time or non-productive time; power and fuel; repair and maintenance *on the machine involved.*

In summary, we see that records are just what we make them. We can have them "tailor-made" to fit our individual needs or we can have a haphazard conglomeration of "paper-work" which means little to anyone.

Record systems are inanimate, unthinking devices with no will of their own. Whether they give information that can be used depends entirely upon whether they are set up for this purpose.

For your business, you should sit down and list the information which your records *could* give you to make your decisions. With your objectives before you, examine your present system to see its shortcomings.

Call In Professional Help

Call in a professional systems man to advise you on the most efficient way of obtaining this information from your present records or what additional records would be needed. Eliminate all records which give you no useful information, and think about this:

An investment can be made on a good record keeping system in the same way as in stocks and bonds. The investment in improving your company may be far more profitable *for you* than investing in someone else's firm.

No other Heat Pump...Only the

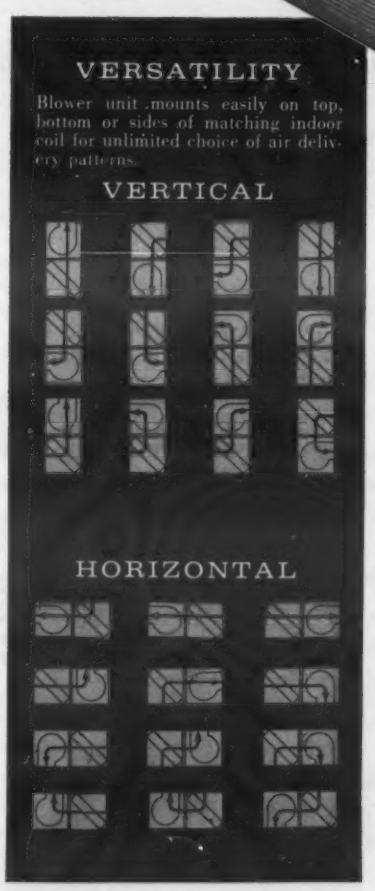
PERFECTION TRI-PAK®

offers you the ULTIMATE in installation flexibility

REMOTE CONDENSER — compressor and air cooled condenser located outside.

INDOOR COIL — compact coil unit has extra row of tubing for balanced heating capacity.

AIR HANDLER—quiet blower unit mounts on side, top or bottom of indoor coil unit for installation flexibility.


VERSATILITY
Blower unit mounts easily on top, bottom or sides of matching indoor coil for unlimited choice of air delivery patterns.
VERTICAL
HORIZONTAL

PERFECTION TRI-PAK is a TRUE heat pump and a true profit-maker. "Climate-designed" for more sales in any area, Tri-Pak is "profit-designed" for easy installation, handling and servicing. No other heat pump offers such versatility in installation.

THREE AND FIVE-TON CAPACITIES for any type of home, store or office.

CLIMATE-DESIGNED with extra inside coil area, automatic de-icing, exclusive UL-approved strip heaters for extra capacity in heating cycle.

COMPACT DESIGN saves space. Fewer, less bulky units to handle and store.

LOW-COST OPERATION creates customer enthusiasm. You can prove lower original, installation and operating costs than individual furnace and air conditioning system.

GUARANTEE, WARRANTY closes more sales. Guaranteed capacity, five-year compressor warranty are customer "clinchers."

BE A PERFECTIONIST! See your nearby Perfection Distributor for full information on the complete Perfection line. Ask him for the free booklet, "How to become a PERFECTIONIST." It's new, and loaded with sales tips. If you don't know him, ask us for his name.

PERFECTION DIVISION
HUPP CORPORATION
CLEVELAND 10, OHIO

They'll Do It Every Time

by Jimmy Hatlo

CUBEB--- SHOW THEM THE GOLD WATCH THE FIRM GAVE YOU FOR BEING THERE TWENTY-FIVE YEARS---
HOW MANY CARATS? OUR OUTFIT GIVES OUT PLATINUM WATCHES FOR BEING THERE TEN YEARS--TWENTY-FIVE YEARS, THEY GIVE US STOCK IN THE COMPANY AND A TRIP AROUND THE WORLD---I HEAR YOUR OUTFIT IS PRETTY SHAKY--I KNOW THE HEAD MAN OF YOUR JOINT---WHATTIZNAME-- VERY WELL---
WINDBERRY, THE TALE TOPPER, IS ON AGAIN--IF YOU KNOW A GUY WITH TWO HEADS--HE KNOWS TWINS WITH THREE APIECE---
YEAH--I SHOWED HIM A PAIR OF CUFF LINKS THE LODGE GAVE ME--HE SAID HE WON THE SAME KIND IN A SHOOTIN' GALLERY---
WINDY'S THE SEVERANCE PAY KID--HE'S NEVER BEEN WITH ANY OUTFIT LONG ENOUGH TO DENT HIS SEAT CUSHION!
TUNING IN ON THE TEARER-DOWNER AS HE SPOILS A PAL'S BIG MOMENT----
THANK AND A TIP OF THE HATLO HAT TO RALPH MUELLER, 1583 E. 31ST ST., CLEVELAND H, OHIO
1H2
© 1960, King Features Syndicate, Inc., World rights reserved.

You Can't Win If Government Pulls The Rug From Underneath You

DESPITE PRETTY predictions for the new decade ahead, this sober fact must be kept in mind: Economic development in the 1960's will depend largely on—

HOW WELL THE LINE IS HELD AGAINST INFLATION

Most forecasters agree that a period of great growth is in prospect. They foresee vast new frontiers ahead.

Businessmen are eager to score new break-throughs in domestic markets and to invade promised lands of opportunity abroad.

Evidence to support this optimism is exhilarating. But the cold fact remains that prosperity always must be earned. Also, it can be wrecked by "funny money."

None of us can go from where we are to where we want to be unless our Body Politic is reasonably free from government controls —and unless we have access to sufficient risk capital to support new ventures.

Overhauling and reducing America's tax burden—which bears heaviest against potential sources of risk capital (earners and savers)—is a foregone necessity.

Reduced Federal spending, which can result only from individual and local initiative, *and less reliance on Uncle Sam,* also is indicated.

Everyone can participate in this necessary effort to revitalize thrift.

It will be up to businessmen, however, to give the movement leadership—and thus open the way to those larger opportunities our U.S.A. requires to retain (or regain!) world leadership.

Non-defense categories of Federal spending will provide the best opportunities for pruning.

Between fiscal years 1955 and 1959 Federal expenditures—other than for national security, international affairs, and debt service—rose 55% (from $15.4 billion to $23.8 billion).

Much of that additional spending wasn't necessary, even though it may have seemed desirable to many pressure groups.

Particularly deplorable are farm price supports. Federal policies now encourage farmers to produce, not for market, but for unconscionable storage and waste in government-hired (at fantastic profits) warehouses.

Unsaleable surpluses of grains, etc., continue to pile up toward an impossible disposal dilemma.

Presently our food storage and interest costs on the $9 billion farm surplus hurt taxpayers $3 million a day—a bill paid alike by farmers and consumers—everyone indeed.

The charges: six billion dollars a year for agricultural "assistance," plus four billions more annually in higher prices to consumers.

Are we all nuts when we vote?

Price supports should be a form of protection against sudden market fluctuations. They should not bilk consumers and taxpayers so shockingly as they do now.

Getting rid of the surplus wheat, etc., already in government warehouses—in a manner which will not upset present markets for farm products—is a pressing problem which must be solved by whomever dares to assume responsibility for cutting this Gordian knot.

(Nixon? Kennedy?)

Between 1949 and 1958 the average net profit for farmers who sold $10,000 or more a year in crops dropped almost one third. These big farmers supplied two thirds of farm-product sales.

In 1959, it's estimated, their total profit was less than in 1958—*but they were protected against losses.*

This protection helps the tiny family-farm scarcely at all, however.

Solving the agricultural "protection" situation isn't just a problem for farmers on one size plot—or any size. It's a debit for everyone.

By continuing present ridiculous agricultural policies we are:

(1) Voting for higher prices;

(2) Voting for higher taxes;

(3) Voting for prolonged farmer distress.

Let's quit being suckers for a tiny pocket of voters who've lost all claims to neediness! Let's redress our own (consumers) grievances!

AN INTERNATIONAL INSTITUTION • SUBSCRIBERS ALL OVER THE WORLD

Trade Mark reg. U.S. Pat. Office; Est. 1926

AIR CONDITIONING HEATING & REFRIGERATION NEWS

Copyright 1960, Business News Publishing Co.

F. M. COCKRELL, *Founder*

'The Conscience of the Industry'

Published Every Monday by BUSINESS NEWS PUBLISHING CO., 450 W. Fort St., Detroit 26, Mich. Telephone Woodward 2-0924. Subscription Rates: U. S. and Possessions and Canada: $6.00 per year; 2 years, $9.00; 3 years, $12.00. All other countries: $10 per year. Single copy price, 40 cents. Ten or more copies, 30 cents; 50 or more copies, 20 cents each. Send remittance with order.

EDITOR & PUBLISHER, George F. Taubeneck

EDITORIAL DIRECTOR, Phil B. Redeker

ASSOCIATE EDITOR, C. Dale Mericle

ASSISTANT EDITORS: John Sweet, Hugh Mahar, George Hanning

TECHNICAL EDITOR, Frank Versagi

EDITORIAL ASST., Terry Treiber

GEN. MGR., Warren Jones

RESEARCH & PROMOTION DIRECTOR, John MacLean

GEN. PROD. MGR., Walter Schuler

ADV. PROD. MGR., A. M. Barrow

CIRCULATION MGR., Rosalie Ashley

READER'S SERVICE MGR., Dorothy Rose

PRESIDENT & PUBLISHING MGR., Edward L. Henderson

VICE PRESIDENT & ADV. MGR., Robert M. Price

VICE PRES. & ASST. PUBLISHING MGR., Allen Schildhammer

WESTERN ADV. MGR., Rex Smith

EASTERN ADV. MGR., Frank Taylor

ADVERTISING OFFICES:

New York, 521 Fifth Ave. MUrray Hill 2-1928-9 Robert M. Price, Frank Taylor

Chicago, 134 S. LaSalle St. FRanklin 2-8643-4 Rex Smith

Detroit, 450 W. Fort St. WOodward 2-0924 Allen Schildhammer

Los Angeles, 4710 Crenshaw Blvd. AXminster 2-9501 Justin Hannon

Member, Audit Bureau of Circulations. Member, Associated Business Publications.

VOLUME 89, No. 9, SERIAL No. 1,614, FEBRUARY 29, 1960

UL SUPPLEMENT GIVES STANDARD FOR AIR FILTERS FOR NUCLEAR ENERGY INDUSTRY

The George Evans Corp.
Moline, Ill.

Editor:

Enclosed is a tear sheet from Underwriter Laboratories December, 1959, supplement on "Air Filters for use in Nuclear Energy Industry."

Thought you might be interested in the difference of opinion expressed in your article on the Civil Defense Office and the air filtration requirements set up for Underwriter Laboratories.

HOWARD C. EASTER

* * *

Air Filters For Use in Nuclear Energy Industry

The Laboratories is pleased to announce that the first Standard for devices intended specifically for the nuclear energy industry has been completed. In September, 1959, a Standard for High Efficiency Air Filter Units was released. These air filter units are intended for use in exhaust ducts of ventilating systems of hoods, caves, rooms and areas where radioactive materials are processed or handled. Their purpose is to remove particulate matter from the exhaust air stream and they are required to be 99.95 per cent efficient for particles 0.3 micron (0.00004 inches) or more in diameter. Thus radioactive dust, smoke or similar particles are trapped and prevented from discharge to the atmosphere where they would constitute a serious radiation contamination hazard.

Because failure of the filter unit to operate as intended might induce serious radiation hazards, the Laboratories has agreed to check test the efficiency of these units as a part of the factory Label Service follow-up program. In addition, tests insuring a high degree of resistance to fire are included in the Standard.

Manufacturers have been advised that applications for submittal of these devices for examination, test, and listing will be accepted and it is anticipated that these units will be labeled in the near future.

Handy Way to Subscribe

To See the Industry In Action EVERY WEEK

Keep up-to-date on what's going on in your industry. You'll see action weekly in AIR CONDITIONING, HEATING & REFRIGERATION NEWS. Covers latest news and gives you top how-to-do-it reports on residential, commercial, and industrial air conditioning, heating, and refrigeration for contractors, dealers, consulting engineers, distributors, servicemen, and manufacturers. Read the industry's only newspaper every week—you'll profit by it—only $6.00 per year, 52 issues (U.S. and Canada). Foreign: $10 per year.

AIR CONDITIONING, HEATING & REFRIGERATION NEWS
450 W. Fort St., Detroit 26, Mich. 2-29-60

Send the NEWS every week for: ☐ One Year $6. ☐ Three Years $12.
☐ Payment Enclosed ☐ Bill Me ☐ Bill Company

Name.....
Company.....
Street.....
City..... Zone..... State.....
IMPORTANT: Company's Type of Business.....

Miami Air Dealers See 1960 Line

LISTENING to Bill Nessell (l.) of Minneapolis during a huddle following Monday night's Miami Air banquet were David Ray (also seated), vice president of host Miami Products, Inc.; Tom Byrd (standing at left), past president of the National Warm Air Heating Assn.; and L. K. Newell, president of Miami Products. Nessell is field industrial committee chairman of the national association.

* * *

MIAMI, Okla.—Approximately 250 dealers from 26 states converged on the 1960 Miami Air dealers' meeting held by Miami Products, Inc., the company reported.

Highlight of the meeting was presentation of the new and expanded lines consisting of over 60 different units.

Of particular interest was the complete line of heat pumps, commercial refrigeration, and the all new three dimensional horizontal and duct furnaces.

Tom Byrd, past president of the National Warm Air Heating & Air Conditioning Association, was the main speaker at the banquet. The dealer group also responded enthusiastically to Bill Nessell's invigorating message, it was noted.

L. K. Newell, president of Miami Products, predicted that in 1960, dealer volume will more than double. He demonstrated to the group that production space and facilities had been keyed in advance for this increase.

"An outstanding event of the conference was a testimonial breakfast by the Miami Chamber of Commerce and the general business group in appreciation of the contribution that the Miami Air and the dealer group is making to their community."

Pointing out that the American dollar is a highly competitive item, Byrd in his talk urged the dealers to "use every marketing help at your disposal . . . and advertise.

"Don't hide your light under a bushel. Advertise your product and your services. You've got to tell the public who you are and what you have to offer."

Byrd, who is president of Lau Blower Co., also advised the dealers to "follow up every sale with personal inquiries . . . and keep moving ahead. There's no such thing as status quo in business. Either you go ahead or slip back."

AIR CONDITIONING ENGINEER

Large contractor desires man with experience in lay out and design of Commercial-sized Air Conditioning, Heating, Ventilation & Refrigeration. Salary up to $11,000 depending on qualifications. Bonus, profit sharing. Metropolitan Chicago area. BOX A6484, Air Conditioning, Heating & Refrigeration News.

NEWS readers are invited to write to the editor giving their opinions on any subject of interest to the industry.

Canadian RSES Plans Show March 23-25

MONTREAL, Que., Can. — Refrigeration Service Engineers Society (Canada) will sponsor an air conditioning and refrigeration show at the Sheraton Mount Royal hotel here March 23-25.

The show will coincide with the group's 21st annual educational convention. Guy Forget, exhibition chairman, said the event is expected to attract from every part of Quebec, the Maritimes, and Eastern Ontario architects, engineers, contractors, distributors, dealers, and service technicians.

Carrier-Bock Claims $5 Million Volume In Air Conditioning Sales

DALLAS — Carrier-Bock Co. here reported that it was ranked as first distributor in the nation during 1959 in dollar volume of air conditioning sales for Carrier Corp.

The Dallas-Fort Worth distributing company which serves 50 major dealers in north Texas said it captured the national lead with a volume which surpassed $5 million during the year.

Spanning a 60-county area of 2½ million people from Abilene on the west to Tyler and Longview on the east and from the Red River on the north to Temple on the south, Carrier-Bock "outstripped the commercial, residential, and industrial air conditioning sales volumes of areas considerably more populous," it was stated.

John H. Bryce Dies

BUFFALO — John H. Bryce, 52, vice president of Joseph Davies, Inc., one of Buffalo's largest heating and cooling contractors, died Feb. 13.

Anaconda Vibration Eliminator, 1½" I.D. x 17" installed in liquid fill line of a 9000-gallon LOX tank installed in a railroad boxcar by Lox Equipment Co.

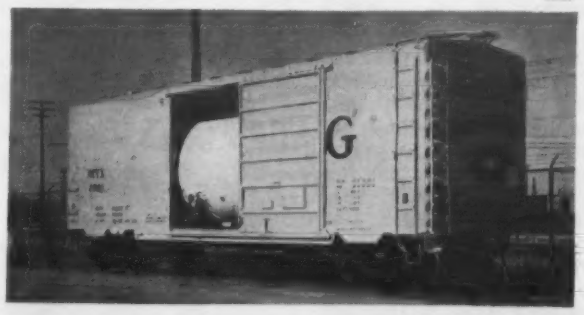
When –297°F LOX hits the piping, Anaconda VE's absorb the shock

Damping vibration in the rigid piping of refrigeration and air conditioning systems is the job for which Anaconda Vibration Eliminators are designed. But every once in a while the basic properties of VE's are called on to handle another kind of tough job—a tribute to their high quality and dependability.

Lox Equipment Co., Oakland, Calif., makes unfired pressure vessels to hold liquefied gases. The company has to provide protection for valves and piping when liquid oxygen at –297°F or liquid nitrogen at –300°F begins to flow. To absorb thermal contraction and shock from sudden temperature swings that may go over 400°F, it has been using Anaconda Vibration Eliminators now for about four years. VE's have the mechanical properties and corrosion resistance needed, and have been doing a good, dependable job, according to Mr. Robert Hampton, general manager.

The inherent strength, toughness, and fatigue resistance of the true tin bronzes used in both the flexible tubing and wire braiding—and the sound design and construction of the entire assembly—are the reasons why Anaconda VE's stand up in severe service, year after year. Use them for lasting system performance in every air conditioning and refrigeration system.

Anaconda Vibration Eliminators—listed by Underwriters' Laboratories through sizes 4⅛" O.D. — are sold by leading air conditioning and refrigeration wholesale distributors everywhere. For folder, write: Anaconda Metal Hose Div., The American Brass Company, Waterbury 20. Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ont.



ANACONDA®
VIBRATION ELIMINATORS

Help Customer with 'Foot Work'

Performance of Finished Job Does the Real Selling, Ray Winther Tells NCRSA

ATLANTIC CITY, N. J.—"It is the performance of the finished job that does the real selling in our business," Ray Winther, San Francisco distributor, reminded members of the National Commercial Refrigerator Sales Association at its annual convention here.

"We can talk and we can promise, but the first time we do not deliver the goods, we are through selling," the newly-elected NCRSA president asserted.

Thus, he advised, it behooves the distributor who wants to be successful to sell quality jobs and then sell the customer on the "value" of purchasing their equipment from him.

RAY WINTHER (r.), newly-elected president of the National Commercial Refrigerator Sales Association, accepts the gavel of office from retiring president Milton Schwartz.

To illustrate what he means, Winther described the values that he firm offers to customers and how those values have paid off for him.

His talk, edited slightly, follows:

Price and value are two entirely different things. Price is the cost of the bare job; while value is that intangible of desire and performance on the part of the distributor that makes the job perform to the complete satisfaction of the buyer without harass, threats, delays, or litigation.

Just what are the values that we put into our jobs?

Whether the customer is a regional chain, a multi-store operator, or a single store owner, we perform as many functions for him as possible, because his primary job is merchandising.

While he is fully aware of the problems involved in market design and construction, he needs help in the "foot work" required to put a new store together. Here is a value which we perform.

Assist In Appraising Probable Location

The first problem is one of location for the new project. Here we, as distributors, right on the ground, are in a position from our knowledge of local conditions, to **assist in appraising the probable location,** and even in **obtaining the lease.** How could outside representatives perform such a function?

Financing

The next value which we provide is one of **financing the fixturization** of the job, and in some instances, we have aided in putting together the building financing. This one phase of expansion has become so involved that it requires almost the full time of a top man in our organization. It is a value of considerable dimension, because, as distributors, we are either 100% or partially contingent on the fixture finance contract, no matter where it is placed.

Store Layout

With these items out of the way, the next value is that of **store lay-out.** This is a function best performed by the distributor who is on hand, and knows the desires and point of emphasis of each operator.

While the services of the distributor in regard to location and financing may not be of value to the national chain, or to some regional chains, the value of having a local man on hand for the store layout and its technical mechanical details is one of real worth.

We perform the store layout, the **back room planning,** the **electrical layout,** the **plumbing layout,** the **lighting plan,** and incidentally, the **refrigeration plan** with proper piping sizes for satisfactory performance.

These are values far beyond price, but they are services essential to our customer's complete satisfaction.

The store layout, the traffic flow, and the placement of merchandise to bring about balanced profit by taking full advantage of impulse buying is important and could be performed by remote control, but the back room plan and the procurement of its custom built equipment is certainly a function best performed by the man on the job—the distributor.

Have you ever tried to run a rail heater circuit or move a case drain after the concrete floor has been poured? Have you ever had to hunt for a circuit covered by a careless concrete man?

These items are checked by us for minute dimensions before any concrete is poured. We provide a printed check list to give our customer, and ourselves, a double check to avoid needless errors of this type. Is this a real value? Who can best perform such a check?

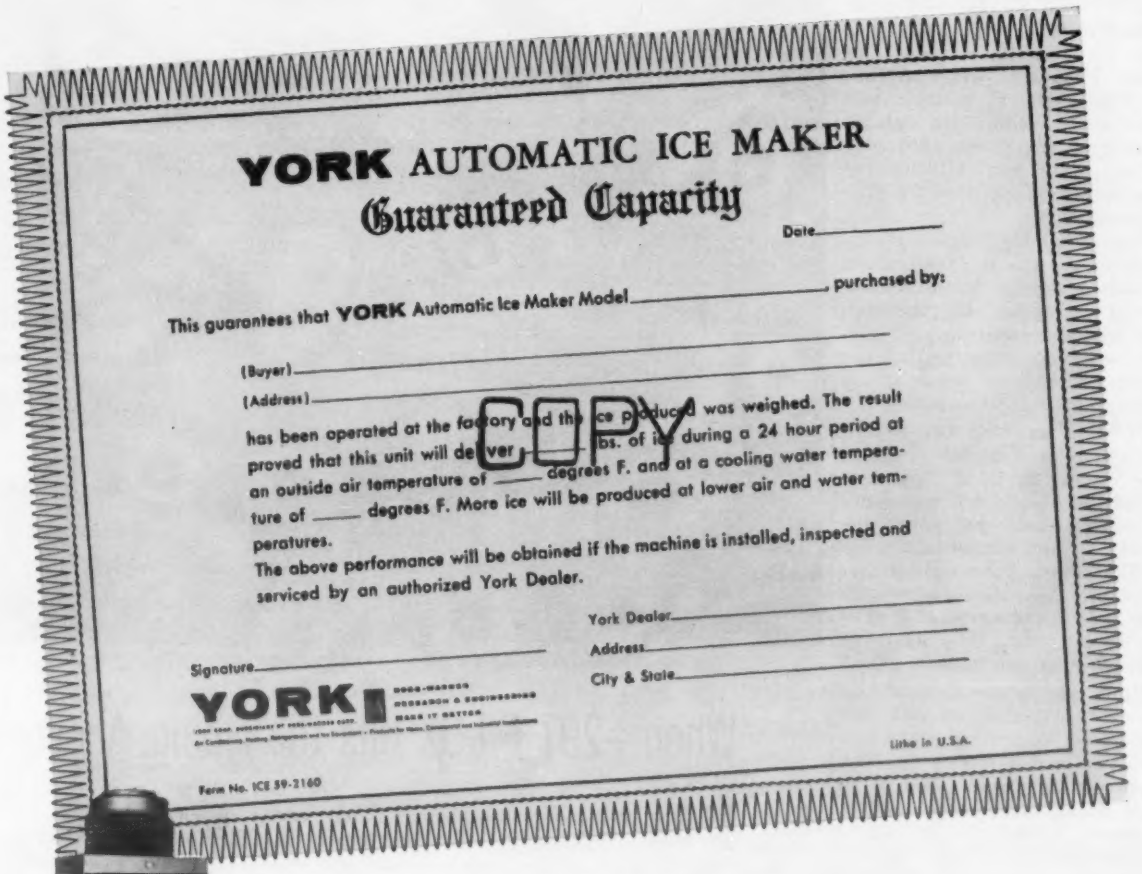
The lighting, the color therapy, the departmental designations, and other details within the market are little things that must be cared for. Who does it? The architect? No—as a rule the man on the spot—the local distributor.

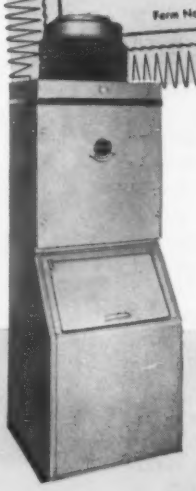
Don't Design Your Customer Short

So far we have delivered many values and we have not talked refrigeration. Here the subject is obvious and I shall just say that certain laws of physics govern the sizing of machines, lines, condensers, coils, and accessory equipment. Any distributor who designs his customer short in order to produce a low price and get a specific job, is not long for this industry.

Here is one place where your

YORK Guaranteed ...An Exclusive Blue


YORK AUTOMATIC ICE MAKER
Guaranteed Capacity
Date
This guarantees that YORK Automatic Ice Maker Model purchased by:
(Buyer)
(Address)
has been operated at the factory and the ice produced was weighed. The result proved that this unit will deliver lbs. of ice during a 24 hour period at an outside air temperature of degrees F. and at a cooling water temperature of degrees F. More ice will be produced at lower air and water temperatures.
The above performance will be obtained if the machine is installed, inspected and serviced by an authorized York Dealer.
COPY
Signature
York Dealer
Address
City & State
YORK
Form No. ICE 59-2160
Litho in U.S.A.



New Blue Chip Incentive Bonus For Dealers!

Fly to fabulous San Juan, Puerto Rico for a full week's vacation! Every recreational facility, lavish entertainment, sightseeing! You may even earn a dream vacation to hallowed, old-world Rome with its storehouse of art treasures!

Full Line of YORK Cube Makers, Flake Makers!

Air, water and remote water-cooled models with daily output up to 450 lbs. of cubes or 8,000 lbs. of flakes.

sins catch up with you in a hurry. The first hot day that comes along, your shortage will show up and you have put yourself right into the hot spot where all sinners eventually go. Give your customers full value on your mechanical work—it really pays.

As for the fixtures, cases and equipment, I shall use the philosophy of our service manager —"All the major manufacturers make equipment that can be made to work." The manufacturers present should really take that as a compliment, because what he means is that most—not all, is due to faulty or poor application. So when the **fixtures are installed and made to perform** their specific function, that is a value to our customer.

Coordinating the Job

One of the most important values that we deliver to our customer is the **coordination of the job.** Since we have no direct control over the general contractor and the other sub-contractors on the job, ours becomes a difficult problem of guessing the date for delivery of equipment.

It must be ordered in time to permit the factory to ship, and still it cannot arrive before the floor is ready to receive, and how often is the contractor on time?

If the equipment is rolling and the job is delayed, who **stores the equipment,** and has it ready on a moment's notice? The shipper? No! The distributor does it. Certainly you can ram demurrage down someone's throat, but it does not promote good customer relations.

We simply store the equipment if sometimes we miss connections. If some of the equipment arrives damaged, we **substitute pieces from** our own floor **stock,** and do not delay the customer until another piece can be shipped from the factory. Is this a value? Yes, and most customers know it.

Here is a problem well known to all distributors. A new piece of equipment is being produced at the factory for release in 60 days. We get wind of it and sell for installation in 30 days.

Somehow the equipment gets shipped, and upon arrival, we realize that they really did need the other 30 days because things do not fit. The brackets are weak; the superstructure sags; the joining kit does not fit; etc. etc.

This presents a problem, not for the factory, but for the distributor. The job has to go, and the **equipment has to be made to look good,** and much field work has to be done right now.

With the factory far, far away, who does it? The man on the job. He does it not only for this job itself, but also for the sake of future business as well. No one could wait to correct such a thing through the regular channels.

We just had a specific case in which a large buyer had purchased competitive equipment of a new design. It was ordered for two jobs, but since the first installation had miscarried, the buyer refused to accept the second job.

Rebuilding Job Paid Off In New Order

One of our suppliers had a similar item in production, for future release, but through special effort he was able to deliver in time for this job. The equipment arrived for an over-time weekend remodeling job, and in the midst of the installation we found that something was wrong, and Monday morning was only hours away.

By good luck and an excellent local sheet metal man, we rebuilt the job on Sunday afternoon. Monday morning everything was in fine operating order, and our customer was completely satisfied.

The moral of this story is that the specifications soon came out for the third job, requesting equipment with our particular brand name and specified as (only XYZ Brand acceptable).

That **rebuilding job** was a real value to our customer—he knew it. We had sold and installed a perfectly satisfactory job, and what is more, we and the factory we represent were rewarded with another sizeable order.

There are many additional values that we sell our customers—little things we do in the course of the mechanical installation, such as the use of nitrogen in our lines when we do welding. This prevents scaling inside the tubing which in turn, prevents contamination of the system from loose scale particles.

We still use high vacuum pumps to check leaks and to completely evacuate every refrigeration system. We still take periodic oil checks from compressors to determine if any contamination has escaped our careful check-ups.

Installation Check Man Looks After Details

We still have an installation check man who performs a complete detail inspection of every new installation. He not only checks the job, but corrects and finishes every detail.

We still have our **30, 60, and 90-day inspection service** to see that every piece of equipment is doing its full job. These inspections are performed without a call from the customer.

After the 90 days, we sell the customer on the economy of our **Monthly Preventive Service.** Over the years it has proven to be a real value to our customers, by reducing to practically nothing the emergency service on equipment and by prolonging the life of the equipment itself.

Goes Beyond Factory Guarantee

We also still **go beyond** the actual word of **the factory guarantee,** if necessary, to assure the customer that in buying from us, he has bought a real value.

A few years ago, we were forced by the strike at the Copeland factory, to go on the outside and purchase condensing units for several jobs in progress.

These compressors after only two years, proved defective when used with R-22, and in spite of the assurances at the time of purchase that they were adaptable for our application, the manufacturer refused to make good.

However, we replaced all the defective compressors, and all like it which we had installed, at a net cost to us of over $17,000. Needless to say, we are not buying condensing units of that make at the present time.

Was that service a value to our customer? You can bet your life it was! But it proved valuable to us too, because it was just another way to sell our

(Continued on next page)

Capacity Certificate Chip Dividend for 1960

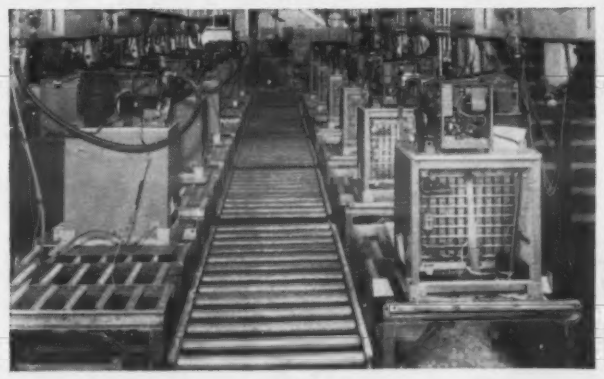
Your passport to even greater sales and profits with the most modern ice maker line in the industry today!

York *guarantees in writing* the rated capacity of every ice maker it sells. Not "up to" or "as much as". No unsupported claims! But now every York dealer can offer his customers a written guarantee that the ice maker he sells will deliver a specific capacity of ice per day. And he knows that York stands behind every guarantee. A powerful sales closer with every prospect that you call on!

York is first in features, too! Exclusive Ice Size Selector lets customer dial any size "cube" he wants. York ice flakes are drier, harder, longer-lasting than ordinary ice...won't clump together. And the York Lease Plan is the greatest door opener of all! Mail coupon for full details.

Made Possible By—

RIGID TESTING UNDER ACTUAL OPERATING CONDITIONS



Each York Ice Maker is tested on this line under actual operating conditions. Ice produced is collected in tray beneath each unit.

ACCURATE WEIGHING OF ICE OUTPUT PER UNIT

Ice produced by each machine is carefully weighed. Units must equal or exceed their rated capacity before being released for shipment.

MAIL COUPON!

General Sales Manager ARN 2
Packaged Products Div.
York Corporation
York, Pa.

Please send me full details on 1960 York Ice Makers, Lease Plan, and Blue Chip Incentive Bonus.

NAME_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

York Puts More Into Every Unit, So You Get More Out of It!

YORK. YORK CORP., SUBSIDIARY OF BORG-WARNER CORP.

BW DIVISION. BORG-WARNER RESEARCH & ENGINEERING MAKE IT BETTER

Air Conditioning, Heating, Refrigeration and Ice-Making Equipment • Products for Home, Commercial and Industrial Installations

Giving Customer Extra Value--

(Continued from preceding page)

customers on the value of purchasing their equipment from us, which they are still doing.

Another selling tool, important as it is, second only to performance, is advertising. We use institutional advertising in our local Grocers Association magazine; and a considerable amount of direct mail—all of which keeps our name before our customers and our "not-yet-customers."

But today, in the area of associations, buying groups, conventions, and meetings, the word-of-mouth telling of work well done is the most potent selling tool of all.

To do this job of selling, the organization does not have to be big. If small, it will grow, and if large, it will get larger, because performance is the thing.

The old scheme of a selling organization doing a high pressure job of selling and then farming the installation and service out on a contract basis is, in my opinion, dying.

There must be both a financial interest in the job, as well as a long range felling of sincere interest in customers well-being.

Admittedly, there is a selfish interest in such an approach, but it is healthy for both parties involved, because the customer receives a true and fair value and the distributor maintains for himself a steady, long-range customer.

To upgrade our industry it behooves all of us to deliver more and more values to our customers.

Meyer Wins American Air Filter Award As 'Outstanding Young Salesman' of '59

AAF President W. G. Frank, left, congratulates Nelson Award winner C. Louis Meyer.

LOUISVILLE, Ky.—C. Louis Meyer has been honored as American Air Filter Co.'s "Outstanding Young Salesman" for 1959.

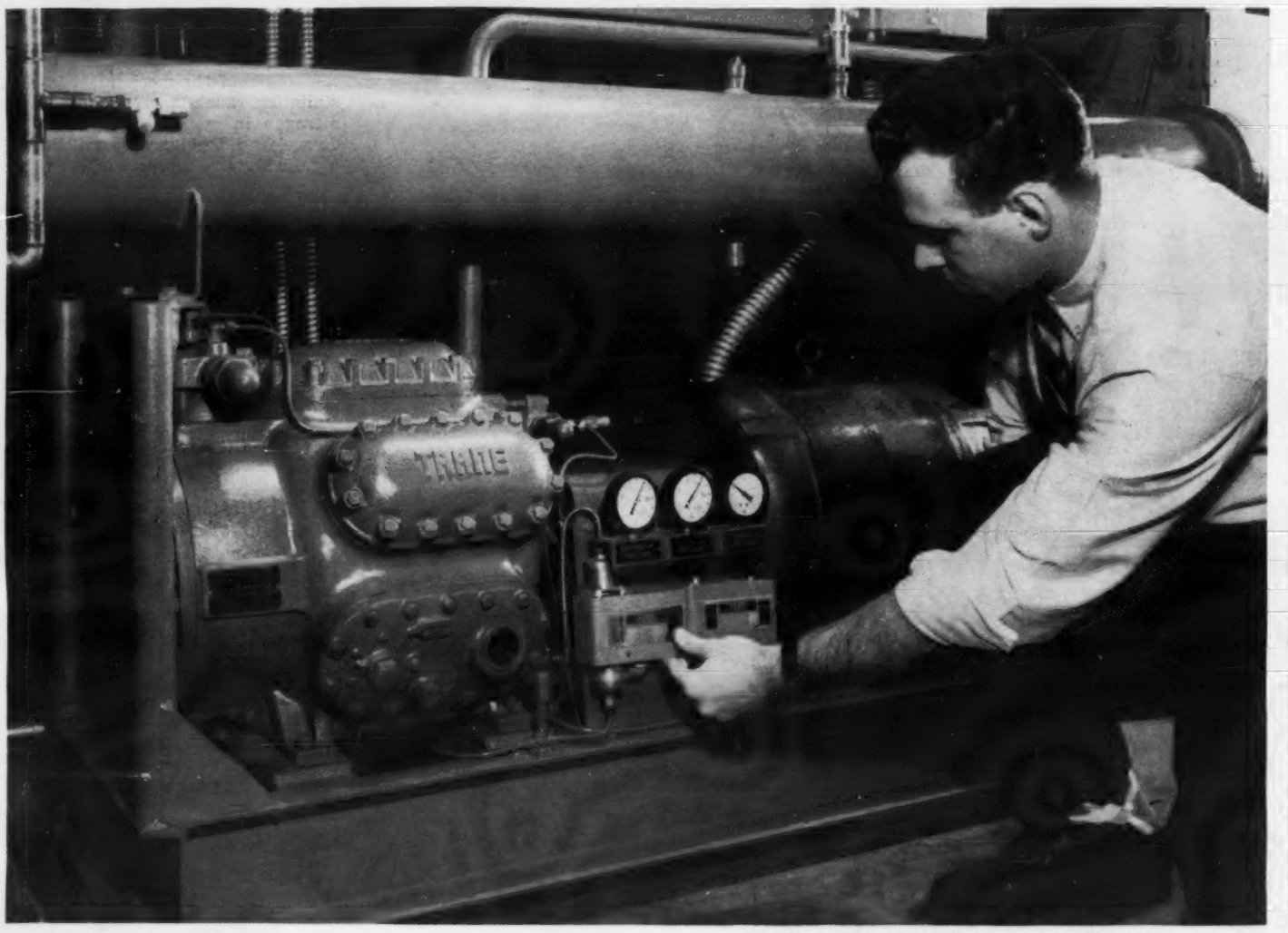
Meyer, who is affiliated with Air Filter & Equipment Co., Chicago, became the first recipient of the annual Robert W. Nelson Memorial Award.

The Nelson Award was established last year by members of his family in memory of the late AAF vice president who died in 1958. Eligible were personnel of AAF's field sales force who had not reached their 32nd birthday.

* * *

Considerations were based on the individual's activities which best combined initiative, product knowledge, and sound selling practices in promoting the sales and acceptance of AAF products to the maximum benefit of customers and company.

Meyer, 30, was presented a replica of a permanent plaque for his permanent possession and shares of AAF common stock. Meyer is a 1954 graduate of the University of Louisville's Speed Scientific School (BME). He joined AAF in 1954 and moved to Chicago in 1955.



New Century 30 hp part-winding start motor driving reciprocating compressor. Compressor is part of an air conditioning system in an industrial test and research laboratory.

New Century Electric motor for part-winding start

Problem: power company restrictions limit inrush current . . . a part-winding start motor is called for, but . . . acceleration must be smooth and quiet with no risk of stalling at two-thirds of full speed.

Answer: the new Century part-winding start motor.

A special winding scheme makes this performance possible. So now you can have part-winding start, dependable power and smooth acceleration all in the same motor. Century part-winding motors provide the most economical and dependable way of starting equipment such as fans, blowers, centrifugal pumps and compressors, as well as reciprocating compressors with unloading valves (like the one shown here). They are available in 20 to 150 hp sizes and in speeds of 1200 and 1800 rpm.

Why do Century Electric part-winding motors provide reliable power? Here are a few of the reasons: windings are dipped and baked with several coats of a high temperature synthetic varnish which protect against oil fumes, mild acids, dust and grit . . . rotors are dynamically balanced so motors run smoothly and quietly . . . rugged cast iron frame gives long life and reduces noise level . . . coils are insulated with a tough polyvinyl resin.

For more information on Century's complete line of motors (1/20 to 400 hp) please contact your local Century Electric Sales Office or Authorized Distributor.

CENTURY ELECTRIC COMPANY

St. Louis 3, Missouri *Offices and Stock Points in Principal Cities*

Century

60-6

Service Firm Moves To Larger Quarters

FORT WORTH, Texas. — Space will be doubled for the A. Briggs Co., local service firm, in its new quarters at 3904 W. Vickery here, according to Reed Briggs, head of the company.

Offices, shop, and warehouse will be combined under one roof, and the increased space will permit more shop repairs.

Two big advantages are seen by Briggs in the move.

"We'll have drive-in space for our trucks which will permit loading and unloading indoors regardless of weather," he says.

"We'll also have an electric hoist so that only one man will be needed for loading and unloading trucks. This is especially important during the rush season because it frees another man," Briggs explained.

Dollies and two-wheel hand trucks are used for shifting equipment within the building.

Front section of the building will provide office space for the dispatcher and bookkeeper plus counters for the servicemen.

Dollinger Promotes John J. Hart

ROCHESTER, N. Y. — Dollinger Corp. has appointed a new chief engineer and a research director, according to Lewis L. Dollinger, Jr., president of the filter manufacturing firm.

John J. Hart has been promoted to chief engineer. Replacing Hart as research director is E. Grant Pike.

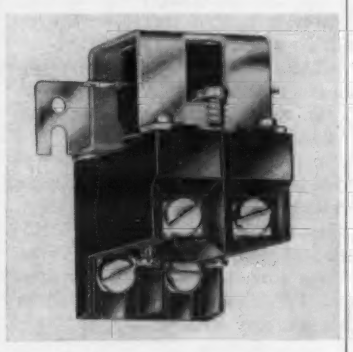
Hart has been with Dollinger since April, 1952.

Signal Whistles When Filter Needs Changing

● A "low cost" filter signal that "whistles when filters need changing" to automatically tell when to change or clean filters on any air conditioning, air handling, or forced warm air heating system is now available from Viking Instruments, Inc., Dept AH&RN, East Haddam, Conn.

Called the "Filter Watcher," this filter signal installs on the blower enclosure between the filters and the blower. As the filters become dirty and clogged, the blower sucks air through the filter watcher whistle, which gradually builds up an audible whistling alarm signal that automatically indicates when it's time to clean or change the filter, the company explained.

Filter Watcher is easily installed by simply tapping a ½-in. air passage hole through the blower enclosure and affixing the Filter Watcher Whistle with self-tapping screws, it was stated.



Contactors Designed For Wide Range of Uses

● Availability of two new Type "B" magnetic contactors designed to meet the control requirements of a wide range of air conditioning applications, has been announced by Arrow-Hart & Hegeman Electric Co., Dept. AH&RN, 103 Hawthorn St., Hartford 6, Conn.

It is stated that the Type "B" 25 ampere contactor, which is available with 2 or 3 poles, will meet the requirements of 85% of all residential air conditioning units.

The larger model, available in 30 and 40 ampere types with 2, 3, or 4 poles, is suitable for most commercial and residential compressor applications up to and including 10 hp.

MINERALLAC.
HEAVY DUTY & MEDIUM
JIFFY
CLIPS

Also available without mounting hole for use with gun.

Made of heavier materials! Has exclusive inverted rib, that provides more strength at the bend of clip . . . and, of course, adds the benefits of famous "Snap On" feature! Send for literature.

MINERALLAC ELECTRIC COMPANY
25 N. PEORIA ST. • CHICAGO 7, ILL.

Cobra Compensator Is For Heating, Cooling

● A new, patented suction-head compensator has been announced by Cobra Pipe Supply & Coil Co., Dept. AH&RN, Elmwood, Conn.

"Essentially the compensator consists of an unusually designed type of chamber containing a reservoir which acts as a cushion, smooths out pulsation, and eliminates surges due to increases or decreases in the pressure," it was explained. "The compensator is effective on both heating and cooling systems, and is available in two sizes for home or industrial use.

"It operates successfully on water or any liquid. The Cobra compensator is installed in the return line at the inlet or suction side of the pump," according to the manufacturer.

'Wej-It' Reduces Labor For Concrete Mountings

● A one-piece, single integral expansion bolt, designed to simplify the fastening or anchoring of electrical equipment, structural members, machinery, etc., in concrete, masonry, plastic, stone, steel, and other non-frangible materials has been announced by Kirel, Inc., Dept. AH&RN, Kingston, N. Y.

Called the "Wej-It," the bolt eliminates the need for marking operations, requires only one-size hole, and expands as it is wrench-tightened to provide a lasting anchor, the company said.

Upright Freezer Features Fully Adjustable Shelves

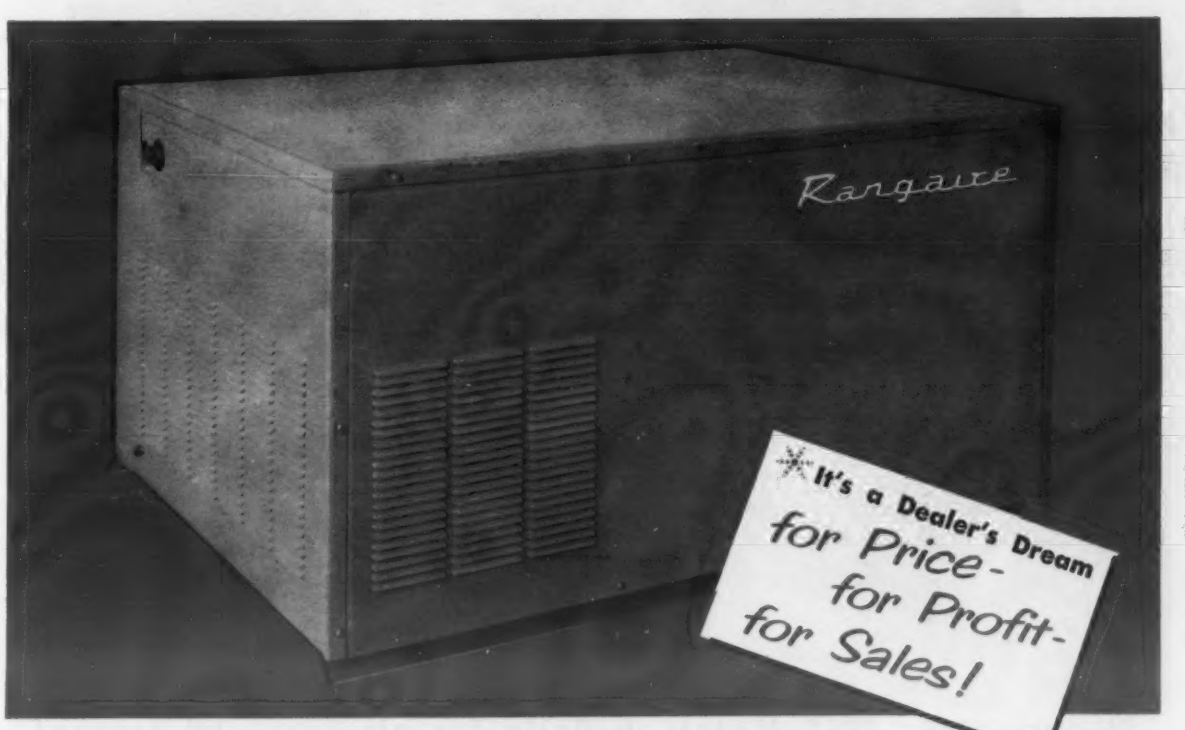
● New upright freezers with fully adjustable steel shelves include models F-170, F-190, and F-220 with respective capacities of 16.1, 19.8, and 22.2 cu. ft., it was announced by Manitowoc Appliances, Dept. AH&RN, Manitowoc 6, Wis.

"All these models have illumination, ice blue interior trim, and new exterior styling that features modernistic hardware and square design," it was pointed out. "No frost build-up occurs on packages or shelves and air temperatures remain at zero or below.

"Instead of building coils into shelves, Manitowoc uses a 'wrap-around' system that sheathes the entire storage area with coils in the top, bottom, side walls, and back. This construction applies the 'thermos bottle principle.' "

A NUMBER of new products that were shown at the Second Southwest Air Conditioning Exposition in Dallas are pictured on page 24 of this issue. Other pictures from the show appeared in earlier issues of the NEWS.

Where Competition's Hot...
Cool 'em with
Rangaire



Rangaire Has the Extras that Mean More Sales

Imagine! air conditioning that costs less to install, less to operate (up to 30 per cent less) than competitive brands. It's a dealer's dream come true. And on top of that, Rangaire has lots more sales-paced extras to cool the hottest competition. Just look at them!

A Complete Line Of Units To Fit Every Need
A Price To Fit Every Budget
Easy Installation — Completely Packaged
Color Harmonized — Cabinet Blends Into Surroundings
All Components, Extra Large Capacity
Proved In Nation's Heat Belt
Extra Long Life
Factory Guaranteed

A Rangaire dealer-franchise makes good sense because Rangaire dealers have what it takes for sales.

Get the Facts-

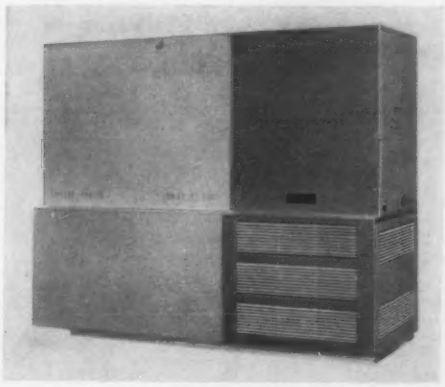
Fill out and mail the coupon today!

COBELL INDUSTRIES INC.
CLEBURNE, TEXAS
Dept. H3

Please send complete information on Rangaire franchise.

NAME_____
ADDRESS_____
CITY_____ ZONE___ STATE_____

Arkla-Servel Direct-Fired 25-Ton Gas Absorption Cooling-Heating Unit Scheduled for Summer Output



NEW DIRECT-FIRED Arkla-Servel 25-ton gas chiller-heater, introduced at the 2nd Southwest Heating and Air Conditioning Exposition in Dallas, has total refrigeration capacity of 300,000 B.t.u.h. and heating capacity of 400,000 B.t.u.h. The model DF-3000, which is 104 in. wide, nearly 84 in. high, and 39½ in. deep, is encased within green and charcoal panels.

DALLAS—Arkla Air Conditioning Corp. has provided details on its new direct-fired 25-ton gas absorption cooling-heating unit which was unveiled at the 2nd Southwest Heating and Air Conditioning Exposition here.

The first production model of the Arkla-Servel DF-3000 heat exchanger, a new addition to Arkla's growing family of gas air conditioning equipment and other gas-operated products, was displayed at the Unified Gas Air Conditioning Exhibit in Dallas' Memorial Auditorium.

Arkla also exhibited its new model 500C Sun Valley Remote gas air conditioner, the new "Gasign," and Humphrey heating equipment.

"The model DF-3000 is the results of years of heat absorption research pushed to a successful conclusion through an expanded product engineering program which Arkla has carried on since acquiring the air conditioning division of Servel, Inc. 2½ years ago," it was stated.

W. R. Stephens, president of Arkla, said this unit "opens up an entirely new dimension in gas air conditioning. For one thing, it is a true first for the industry. The DF-3000 is the first medium and large-tonnage absorption unit ever to provide both cooling and heating.

"Second, by incorporating the latest design refinements and drawing upon our wide experience with the absorption principle, we have been able to put absorption equipment in an even more competitive position on the market.

"But, in addition to filling a large void in the market at a decided cost advantage—and, in fact, creating an entirely new year-round commercial air conditioning market for gas—we feel the direct-fired unit represents a major design breakthrough for absorption equipment."

The DF-3000 eliminates, for example, the need for steam boilers, condensate pumps, and steam and condensate piping, "making possible a relatively simple, economical installation," Stephens said. Arkla expects to have the model DF-3000 in production by summer.

"With the new direct-fired chilled-hot water heat exchanger, Arkla engineers have designed an entirely new absorption package around an already proven absorption cooling system," it was stated.

"In fact, many of the same components used in the present Arkla-Servel steam models—such as the absorber and condenser—are incorporated in the DF-3000. The principal differences lie in the method of firing and addition of heating cycle.

"Instead of using steam to boil the refrigerant-absorbent solution (water-lithium bromide, same as in the steam models), the new unit utilizes a unique and highly efficient type of generator in which a bank of 30 individual burners, firing horizontally down tubes in the generator section, boils solution around them.

"From this point on—after the solution is carried to the separator and the refrigerant vapor proceeds to the condenser—the operation on the cooling cycle is essentially the same as that of Arkla steam units.

"Heating is produced by shutting off the condensing water, causing what would be hot refrigerant vapor on cooling to enter the evaporator directly. Thus the secondary circulating water is heated to temperatures up to 170°.

"As in other Arkla absorption models, this 'sealed system' exchanger operates without any mechanical purge or circulating pumps or compressors. The no-moving-parts design and near frictionless operation offer long, permanent-efficiency service life and freedom from vibration. With low floor loading per ton, the DF-3000 can be installed in almost any location."

R. K. Eskew, Arkla vice president-engineering, research and development, explained, "In general, the direct-fired chiller-heater is the application, on a larger scale, of the principles incorporated in the new remote Sun Valley 3½ ton.

"Our plans call for development of a wide range of capacities from 3½ to 25 tons and beyond in this equipment."

Eskew emphasized that the new models DF-3000 and 500C Sun Valley Remote are not intended as replacements for Arkla's present Series 3000 steam-actuated chillers and Sun Valley gas air conditioners.

"The DF-3000, for instance, will supplement our line of medium and large-tonnage absorption models in meeting certain application and design needs," he said. "Arkla will keep manufacturing the steam units, since they will continue to best satisfy the requirements of many jobs, such as those where there is an economical existing steam source."

Development of the new DF chiller-heater, Eskew said, is part of a program set in motion by Arkla over two years ago which is dedicated to the production of new gas-using products.

Climatic Air...1960 Models & Units for all cars and trucks!

Nationally advertised, prominently promoted, custom-designed for customer-service . . . dealer profits . . . lasting satisfaction . . . that's CLIMATIC AIR auto air conditioner for '60. Made and sold by a company with 28 years experience serving automotive dealers and car owners . . . CLIMATIC AIR is the unit for dealers who plan to SELL and INSTALL profit-building auto air conditioners from now on. Don't sell a "dog" — sell comfort and satisfaction! For full details on distributorships and dealerships . . . write:

3030 CANTON
DALLAS, TEXAS

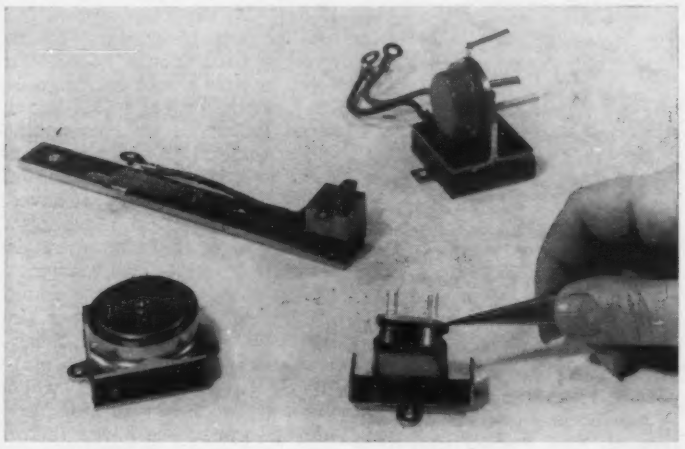
CLIMATIC-AIR
REFRIGERATED
AUTO & TRUCK AIR CONDITIONING

TELEPHONE
Riverside 1-3837

FEATURED OVER TRUTH OR CONSEQUENCES, NBC-TV, DURING YOUR SELLING SEASON!

Westinghouse Bows

Tiny Thermoelectric Modules Ready For Industrial Cooling Applications



WESTINGHOUSE THERMOELECTRIC cooling modules can be adapted with different mounting fixtures for cooling various sizes and types of transistors. By removing the cover of the unit in the right foreground, a mounting configuration for chamber-cooling two transistors can be seen. Clockwise, the photograph then shows: a basic module adapted for cooling four transistors; a smaller device with a chamber-type fitting for cooling one transistor; and a basic 1½-in. module adapted with a fitting for mounting a high power transistor. These thermoelectric cooling devices are compact, provide a controlled cooling rate, are extremely rugged, and provide reliable operation in critical applications.

PITTSBURGH—What is said to be the first line of commercially available thermoelectric cooling devices for industrial and military applications has been announced by the Westinghouse Electric Corp.

D. W. Gunther, manager of the Westinghouse semiconductor department at Youngwood, Pa., disclosed that the company is manufacturing a series of "thermoelectric modules" for use as electronic component coolers, and other applications where compactness, silent operation with no moving parts, and a controlled cooling rate is desired.

These modules are designed in a variety of shapes and sizes for simple mounting in any position when used with transistors, diodes, and other electronic components. The basic units can be physically paralleled to cool a large flat area, or stacked in series like building blocks for increased cooling.

"The need for an efficient electronic component coolers stems from the rapidly changing electronic field itself," Gunther said.

"Space, weight, and operating temperatures are critical requirements when considering the electronic control or guidance equipment of new aircraft and proposed unmanned vehicles. Out of necessity, component parts have been miniaturized along with their associated circuitry to meet these requirements.

"However," he added, "the use of these compact designs can present major heat dissipation problems. Cooling of electronic equipment by present techniques is complicated by the non-uniform distribution of heat generated by certain components. The resulting 'hot-spots' cause a severe heat rise in the component, and effectively derate the total equipment and limit its maximum operating temperature.

"Heat dissipating devices using ambient air improve the heat transfer from the critical components, but these techniques can only limit the temperature rise of the components above ambient temperatures. They cannot cool the component below ambient temperatures.

"Thermoelectric cooling, on the other hand, provides a lower local temperature environment for electronic components. As a result, the probability of early component failure due to 'hot-spots' can be significantly reduced, and equipment can be operated at higher ambient temperatures with greater reliability."

The Westinghouse thermoelectric cooling modules "are rugged and operate with no moving parts, so they can be mounted in any position," it was stated.

"For example, by proper orientation, a number of the modules could be constructed to form the walls of a 'box,' providing a compact space cooler for electronic apparatus. Through use of a variety of specially designed mounting fixtures, the modules can accommodate one or a number of electronic devices such as transistors or diodes.

"The heat pumping capacity, or rate at which heat can be removed from the cold surface of the module coolers, depends on the temperature difference between the hot and cold surfaces of the cooler and on the power input to the unit.

"As an example, a Type WX816 module can maintain a temperature differential of 25° C. with a heat load of more than 17 B.t.u.h.

"To supplement the heat rejection capacity of the module, air or liquid cooling can be applied to the 'hot' side of the thermoelectric cooler. The exact amount and type of this cooling will affect the heat pumping capacity and ultimate temperature of the cold surface temperature of the module.

"In general, the modules require power at high input currents and at low voltage. The current must be supplied from a d-c source or a filtered rectifier output."

Where high humidity is needed . . .

THE LARKIN BAFFLE COOLER COIL

Is ideal for Walk-In Coolers. Florist Boxes, Produce Boxes, Packing Rooms, Etc.

In refrigerators where a high humidity is necessary, it will pay you to install the Larkin Baffle Cooler Coil. By handling a large volume of air and cooling it slightly each time it passes through the coil, it is possible to maintain a higher humidity. Louvers are engineered to provide correct circulation of air and accelerate its flow. Air constantly swirls around stored products, providing proper refrigeration and humidity.

The Larkin Baffle Cooler Coil is durably constructed and is a complete unit. It consists of an aluminum cross-fin coil, double louvered baffle with drain pan, and hangers.

See your wholesaler or write for Bulletin 1057

OUTSTANDING FEATURES

- Patented Larkin Cross-Fin coil with aluminum fins and staggered copper tubes mechanically expanded (aluminum tubes available for ammonia refrigerant)
- Baffles are constructed of heavy-gauge, polished aluminum
- Adjustable baffles easily removed for inspection and cleaning
- Coil and baffle hangers are heavy-gauge die-stamped aluminum channel punched with keyslots for easy attachment
- Matched baffles for left and right sides furnished if specified
- Special-sized baffle cooler coils are also available

WATCHDOG OF THE NATION'S FOOD AND COMFORT — LARKIN

LARKIN COILS INC.

519 MEMORIAL DRIVE, S.E., ATLANTA, GEORGIA

here's the inside story on the KEROTEST NO. R224 DIAPHRAGM PACKLESS LINE VALVE

FOR ALL TYPES OF REFRIGERATION AND AIR-CONDITIONING SYSTEMS

The inside story as you can see above is built-in quality and sturdy construction. Outstanding for high vacuum service, liquified petroleum gases, gasoline, instrument control panels, oxygen (degreased), compressed air, water, nitrogen and refrigeration boards. Full flow, forged brass body, beryllium copper and stainless steel diaphragms are a few of many features. Available in sizes ¼" through ⅜" flare and solder sizes. See your Kerotest wholesaler.

Ask for Model No. R224

KEROTEST

KEROTEST MANUFACTURING CO.
2502 Liberty Avenue • Pittsburgh 22, Pa.

TECH CENTER

by Frank J. Versagi, Technical Editor

Applied Electrical Theory (11)

Different Utilization Voltages Single and Three-Phase Power

Why?

The last dicussion of different utilization voltages indicated the interdependence, in our technology, between supply voltages and the equipment designed to operate off these voltages. Whether the chicken or the egg came first, the fact remains that, at any given time, existing equipment must be able to operate off supplied voltages and any planned change in utility-supplied power must consider the problems of manufacturers of electrical equipment.

At the present time, for example, motor manufacturers must supply equipment which will operate at 120, 208, 230, 416, and 440 volts. These do not include the special higher utilization voltages used in heavy industrial plants which frequently do their own step-down transforming.

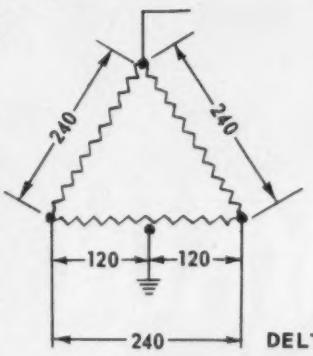
It is of more than trivial interest, therefore, that a move toward higher standard utilization voltages has already begun —to 265/460, or 277/480. Understanding the arguments for and against this trend is easier if the history and *raison d'etre,* reason-for-being, of present utilization voltages are known.

In the beginning, the first commercially successful power supply was 110-volt direct current on a two-wire circuit. Thomas Edison developed the three-wire system which allowed the simultaneous distribution of 110 and 220-volt direct current. (Incidentally, the word **Edison** in a utility company name means that the company adopted the inventor's three-wire system; it does not necessarily imply any financial connections among the many "Edison companies.")

For the reasons discussed in article (9) of this series, direct current was all but completely replaced by alternating current. AC was originally utilized at the same voltages, 110 and 220—over two-wire and three-wire systems. This original a.c. power was generated single-phase. (Direct current, by its nature, does not have phases as does a.c.)

For a while 1ϕ power was adequate. Single-phase motors were reasonable to build, operate, and maintain up to 5 or 7½ hp. Above that size, the motors tended to become clumsy, and the shift to 3ϕ power was largely a result of the growing use of larger motors which are easier to manufacture and maintain 3ϕ than are their single-phase counterparts. During this same growth period, the advantages of higher utilization voltages became apparent, and the climb began from the original 110/220 to today's 120/240.

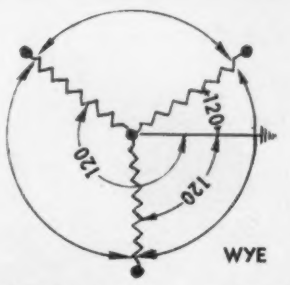
At first, a separate 3ϕ power circuit and a 1ϕ lighting circuit were supplied—five wires. As the industry developed, the dual system was combined into a single-service system, 240-volt, with a center tap on one phase to serve the 120-volt needs. This transformer configuration is termed **delta** and is shown schematically like this:



DELTA

This delta system supplies 3ϕ, 240-volt power and two circuits of 1ϕ, 120-volt power over four wires.

The four-wire system which gives three 120-volt, 1ϕ circuits and a 208-volt, 3ϕ circuit is called wye or Y, configuration and is usually shown like this:



WYE

The wye system has the advantage of being more easily balanced on the customer's premises, whereas the delta has to be balanced by the utility company's being careful of which areas use which type of power. The term **balance** refers to preventing uneven distribution of load among the three phases from which all the power ultimately comes. In the delta diagram, for example, the 120-volt tap is made on different phases at several locations so that no one phase is overloaded.

(A discussion of the mathematics which explain why four wires delta give 120/240 while four wires wye give 120/208 is out of place here. Any electrical text above the elementary level will discuss this aspect of the transformation of voltages.)

From this point, utilization voltages jump to values approximately double the common residential and light industrial voltages—to 240/416 and 265/460, or 277/480. The reason is multiple:

First, all normal distribution and utilization wiring is rated at 600 volts, so the insulation is the same, for specific classes, whether the voltage is 120 or 480.

Second, there is little difference in the switches, relays, and other distribution and utilization details.

Third, motors wound for higher voltages, while the geometry of their windings may be different, will not cost very much more than regular motors.

Fourth—and most important, in larger installations the customer may realize savings up to 35% in wiring costs over a 120-volt base system.

The explanation of this last factor lies in the fact that when voltage is doubled, current is cut in half. At the lower amp draw, smaller diameter conductors may be used. For a house, the total savings would be insignificant, on the order of $20. For a large industrial or commercial establishment, the savings can come to hundreds, thousands of dollars. One large school saved $25,000.

(Although the amp draw is less, the customer still consumes and pays for the same amount of electrical **power.** Power, in watts, is equal to volts-times-amps. The product of this multiplication is the same when volts are doubled and amps are halved. Power and power factor will be discussed in a later article.)

A major consideration in the move toward higher utilization voltages is the very great increase in the use of fluorescent lighting which operates off 277-volt ballasts. In a large installation supplied with 277/480 power, the 480-volt, 3ϕ supply is for equipment, the 277-volt, 1ϕ power is for fluorescent lighting, and a small transformer is used on the premises to get the 120-volt, 1ϕ needed for small appliances and office machines.

During World War II, a 480-volt delta system for power was rather extensively used in defense plants. The 277/480 wye system, now also called 265/460, offered 480 volts for power and 277 volts-to-neutral for fluorescent lighting. The system is advantageous for plants with little or no usage of single-phase, 120 or 240-volt appliances and tools.

From some quarters, there is a growing attempt to halt the spread of the 277/480 system before it snowballs. These people point out:

1. Without an additional transformer on the customer's

"I CAN ALWAYS GET IT WHOLESALE . . ."

Does your customer ever say that to you? Well, he can't get it wholesale from the Harry Alter Co. We sell you . . . not your customer. Our *Dependabook* is sent only to legitimate contractors and servicemen. We do not believe in back door selling.

We're Real Specialists in
REFRIGERATION • AIR CONDITIONING • ELECTRIC MOTORS
SUPPLIES and PARTS

SAVE MONEY, time and effort by ordering from our new *Dependabook,* the most complete catalog of all. 232 pages. Over 10,000 items carried in stock. *Wholesale only.* Your orders filled really fast by mail, or they can be picked up at one of our six big warehouses.

Write on your letterhead for the 1959 DEPENDABOOK . . .
Also our monthly Flyer of surplus and close-out Bargains.

THE HARRY ALTER CO., INC.

1717 S. Wabash Av., Chicago 16, Ill. | 134 Lafayette St., New York 13, N.Y. | 2332 Irving Blvd., Dallas 7, Texas | 695 Stewart Ave., S.W., Atlanta 10, Ga.

FREE PARKING AND FAST COUNTER SERVICE AT THESE 4 BIG WAREHOUSES

Your Best Buy in Refrigeration Thermometers!

BACHARACH GOLD RIBBON Value!

FACTORY NET ONLY $2.55 COMPLETE

$1.70 PER REFILL

REFILL CAN BE INSTALLED IN ALL COMMONLY-USED 5" LONG POCKET THERMOMETERS OF OTHER MAKES

SOLD BY JOBBERS
If your Jobber cannot supply you write to us

SHOCK-RESISTANT
Has rubber shock absorber built into the case and a rubber top cap for the thermometer — providing exceptional resistance to mechanical shocks. Thoroughly annealed glass thermometer tube with tapered bulb withstands thermal shocks.

FUNCTIONALLY STYLED
Case is ovalized; easy to hold, won't roll. Pocket clip has pincer grip which holds thermometer tight even on thin fabric. Push-in, pull-out rubber top cap holds tube in firm friction-grip, centers it safely in case.

VISION ENGINEERED
Black numerals and graduations, magnified against yellow background on flat, double-wing reading surfaces.

JOBBER INQUIRIES INVITED
BACHARACH INDUSTRIAL INSTRUMENT CO.
200 N. BRADDOCK AVE. — PITTSBURGH 8, PA. GR-32

premises, he cannot obtain 1ϕ, 120 or 240-volt power.

2. Single-phase usage is far larger than 3ϕ usage, and it is already standardized at 120-240 volts.

3. Extension of the 277/480 system would mean, in effect, that power would be supplied at other than present utilization voltages; supply voltages would not be compatible with existing equipment.

This same group offers a 240/416-volt system as an alternate. From this it is possible to get the 120 and 240-volt single-phase as well as power circuits for heavy equipment. The feeling is that adoption of this system would encourage the move up to 240 volts for most appliances now using 120 volts, a move favored by most.

Economic arguments are offered on all sides. Utilities, for the most part, assume a posture of indifference, since they can step down their distribution voltages to either 240/416 or 277/480 with no significant difference in cost to them.

Equipment manufacturers and consumers are concerned over the direction the electrical industry will take on this matter. Several associations and technical societies have formed study committees, some in cooperation with utility organizations, some independently.

* * *

A pamphlet listing the type of current (a.c. or d.c.), phase, cycle, and voltage of power supplies around the world is available from the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C. Cost is 20 cents.

file guide—ELECTRICITY: power distribution

Next:
ELECTROMAGNETISM

All Makes Service Renews Gibson Tie For Fourth Year

BROOKLYN—All Makes Refrigeration Service announced that it has completed arrangements with the W. R. Light Corp., distributor of Gibson air conditioners in New York, to be its factory authorized service company for the fourth straight year.

In addition to Gibson, All Makes Refrigeration Service is a factory authorized air conditioning shop depot for such makes as Carrier, Mitchell, Emerson "Quiet-Kool," Remington, and Coolerator, it was pointed out.

The firm also is a factory authorized depot for repair of Gaffers & Sattler room coolers, it was pointed out.

Principals of the company are Jack Katz and Jack Hazan. Katz has been in the refrigeration and air conditioning field for approximately 24 years, Hazan for 14 years.

"Our shop is one of the most modern in the East, with all of the latest equipment, and we have been and still are doing work for independent companies," Katz further pointed out.

NISA To Be EASA, Puts 'Electrical' Back In Name

ST. LOUIS — NISA will become "EASA" on April 1, 1961, when the name of the National Industrial Service Association, Inc., is officially changed to Electrical Apparatus Service Association, Inc.

A new name for the association had been under consideration for many years. The organization was founded as the National Industrial Electrical Service Association in 1933, but the work "Electrical" was dropped a year later to attract memberships from the mechanical service industries.

Although these companies have not been eligible for membership for many years, the word "Electrical" has never been restored. Meanwhile there has been an increasing demand from the organization's membership for a more descriptive name, it was noted.

The effective date of the change was set for next year to give many of the 1,579 member firms in the United State, Canada, and Mexico time to use their supplies of stationery and advertising materials bearing the NISA name and insignia.

Members of the association are independently-owned firms which are primarily engaged in the repair and rewinding of industrial motors, generators, and transformers.

Bulletin Tells How To Test for Leaks

SCHENECTADY, N. Y. — General Electric Co. has announced availability of a six-page bulletin on "Leak Testing of Tanks, Piping and Other Enclosures."

The bulletin, GET-2936, gives detailed instructions on use of halogen leak detectors for finding leaks in enclosures that can be pressurized.

"Live" displays are a feature of the Janitrol service schools. Here, Bob Mees, technical training supervisor, demonstrates one that permits students to check out current characteristics on various network electrical service panels.

Janitrol Annual Factory Service School Offers Drill on '60 Lines

COLUMBUS, Ohio — The annual Janitrol factory service school series starts on Feb. 22 and will extend through May 21, according to H. C. Gurney, general sales manager, Janitrol Heating and Air Conditioning, a division of Midland-Ross Corp.

Three specialized courses, each a week's duration, will be under the direction of Robert Mees, technical training supervisor. The courses include heating, cooling, and advanced cooling, with each course being offered four times.

Mees says that the program has been revised to include all new 1960 equipment lines and several dramatic training aids have been added to give easy-to-remember, practical solutions to current service problems.

Classes are limited to 25 students so that each receives personalized instruction on operating equipment.

Applications for attending the schools may be obtained from Janitrol district sales representatives, or from the national sales manager in Columbus, Ohio.

Price List Helps Buyer Compute Cost Of Copper and Brass Seamless Tube

ALTOONA, Pa. — What it calls a "new and modern method" of pricing seamless tube has been sent out to purchasing agents of firms using copper and brass tube by Small Tube Products, Inc. here.

H. E. Whiteford, Jr., sales manager, said that now, even buyers who only occasionally figure costs will be able to do so with very little trouble.

This new price list has retained some of the computations from the 1959 edition, but such things as additional tables on the composition, fabrication properties, and forming data has been added, it was stated.

Footnotes on converting footage to pounds and how to find third dimensions when two are known, has also been incorporated in the new list.

SEND FOR REPRINTS
"ELECTRICAL CHARACTERISTICS OF PACKAGED AIR CONDITIONING UNITS."
Only 25¢ each.
For your copy, clip this ad and mail with name and address to: Air Conditioning, Heating & Refrigeration News. 450 W. Fort, Detroit 26, Mich.

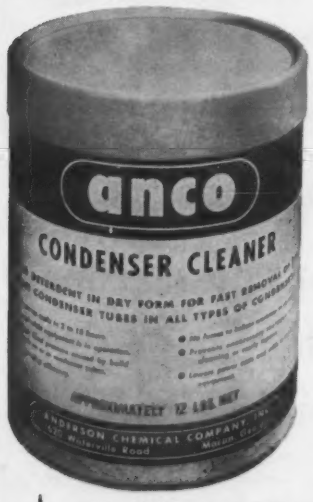
bring head pressure DOWN

keep operating efficiency UP

with anco condenser cleaner

ANCO Condenser Cleaner removes scale and rust from condensers within 2 to 15 hours, depending on scale thickness and composition. Following application, head pressure drops to normal and the condenser's efficiency is restored. Simply dissolve this dry formula in sump while system operates. It works quickly and safely and is equally effective in evaporative condensers and those with separate cooling towers.

Ask your supplier about it.



Specialists in making water behave

Anderson Chemical Company, Inc.
Box 1424 • Macon, Georgia
Memphis, Tenn. • Box 2432 • DeSoto Station

Westernaire IS UNFAIR TO OTHER MANUFACTURERS

We build private brand air conditioning and refrigeration equipment for several hundred accounts, better and at less cost than they can do it for themselves.
"Why don't you get the whole story?"

WESTERN SUPPLY CO.
Contract Manufacturing Div.
315 West Third Box 784
HUTCHINSON, KANSAS

Don't Stock 2 When 1 Will Do . . .

ALLEN-BRADLEY
Selector Switches

good for either 2-position or 3-position operation

Change from 2-position to 3-position or vice versa . . . in 30 seconds!

Just loosen two screws, rotate a metal indicator 90°, retighten screws.

The same Bulletin 800 standard duty selector switch for 2-position use, left; 3-position use, above.

Nothing like it on the market! Watch your inventory. Don't stock two varieties when one will do. Nothing like it in quality, either! The maintenance free, silver contacts are in the cover—protected against dirt, careless wiring.

Allen-Bradley Co., 1313 S. First St., Milwaukee 4, Wis.
In Canada: Allen-Bradley Canada Ltd., Galt, Ont.

ALLEN-BRADLEY
Member of NEMA
Quality Motor Control

Aluminum Spokesman Outlines Steps To Solve Problems of Use In Air Conditioning

By Frank J. Versagi

DETROIT—The aluminum industry hopes to develop a coating for aluminum which will make it unnecessary to use a steel insert in an aluminum compressor to keep the aluminum piston from rubbing directly against the aluminum cylinder, according to Harry Loehlein, project director of appliances, Reynolds Aluminum Co.

Speaking to the Detroit chapter of ASHRAE, Loehlein outlined some of the areas of development which touch on the use of aluminum in heating-cooling applications.

"There is a great deal of work going on in the field of heat exchange. Such development has already resulted in an all-aluminum car radiator, now used on the Corvette, and of all-aluminum evaporator and condenser coils for room air conditioners," he stated.

Aluminum encounters two problems in air conditioning work, he continued, "the corrosion problem when exposed in an aggressive atmosphere and the difficulty of joining aluminum to itself and to other metals."

A major step in the solution of the corrosion problem is the development of the all-aluminum heat exchanger, since this does away with the galvanic corrosion inherent in a contact between copper and aluminum, say, when the contact is in salt water air.

The joining problem seems best solved by the use of adhesives, in Loehlein's opinion. Although the materials are not yet developed for practical manufacturing assembly and field work, the joining of aluminum with catalytically cured epoxy resins looks like the direction the problem's solution will take."

Northern California Contractors Move Toward Certified Journeyman Program

SAN FRANCISCO—Plans for a certified journeyman training program similar to the successful program in Los Angeles and Orange counties are being worked out with United Association locals in the Bay Area by Refrigeration & Air Conditioning Contractors Association of Northern California.

First announced at the 3rd annual convention of RACCA of Northern California in Santa Rosa where the union's California Pipe Trades Council also held its meeting simultaneously, consummation of the journeyman program in forthcoming union agreements was told by M. Maroni Smith, counsel and executive secretary for RACCA-NC.

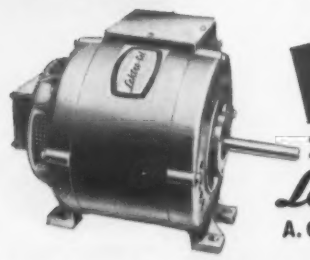
Charles Voss, special representative of the UA for its refrigeration and air conditioning department, brought greetings of the UA's general office.

"The United Association and RACCA have developed a very successful training program which we are putting into effect throughout the United States," Voss told the convention.

Smith said at the convention that "study of the program in Los Angeles impressed us very much. Here in the Bay Area we will have Harry Bowe, the able Los Angeles Coordinator, to put our program into effect.

"You can have this program in Sacramento if you want it, and you probably have it in San Jose," Smith said.

OVER-THE-ROAD REFRIGERATION!
Now! Convert your fleet at low cost!



NEW!

DOLE *Lektro-Cel*
A. C. GENERATOR KIT

- Your present plug-in refrigeration can now be used for Over-The-Road operation.
- Power also available for heating, auxiliary lighting, pumps, etc.
- Kit furnished complete with all necessary parts for ease of installation.
- Low in cost, easily maintained.

DOLE REFRIGERATING COMPANY
5920 NORTH PULASKI ROAD, CHICAGO 46, ILLINOIS
103 PARK AVENUE, NEW YORK 17, N. Y.
In Canada: Dole Refrigerating Products Limited, Oakville, Ontario

Write for Engineering Catalog HGE

DOLE THE *cl* LINE *Lektro-Cel*

COMPLETE REFRIGERATION SYSTEMS ALSO AVAILABLE

What Was New In Dallas

On this page are pictures of a few of the new and newsworthy products displayed at the Second Southwest Air Conditioning Exposition in Dallas, Feb. 1-4. Other pictures appeared in the Feb. 15 and Feb. 22 Issues.

NEW 75-TON HEAT-X packaged chiller equipped with new Brunner multi-drive semi-hermetic compressor is checked by Clark Akers of the Dunham-Bush sales department in Marshalltown, Iowa (l.), and Perley Barker, general manager of the Heat-X Div., Dunham-Bush, Inc.

ONE OF 15 BASIC models of Halstead & Mitchell air handling units that deliver from 880 to 47,500 c.f.m. of air is demonstrated by Harry Smith, Halstead & Mitchell sales representative in Pittsburgh.

SPRAYED COIL humidity control unit with space for 10 rows of coils for cooling and reheat is shown by Fred Henke, sales engineer, and Irving Secord, sales manager of Drayer-Hanson (l.), to Harry Samuels of Airtrol Supply, Corpus Christi, Texas.

"THERMORAMIC CENTER" being introduced by General Controls provides a central indicating and control panel for year-round residential air conditioning. Here it gets a good going-over by Stanley F. Skafte (l.) of Gaffers and Sattler and T. J. Ammel (r.) of York.

NEW LOW SILHOUETTE condensing unit is available in five basic sizes from 10 through 30 tons for air-cooled applications, John Roth, Dunham-Bush product manager (l.), explains to Jose L. Saide Handal of Polar Wind de Mexico, Monterrey, Mexico.

NEW 5-TON air conditioning condensing unit featuring two compressors and two condensers was exhibited by Bar Brook Mfg. Co., Inc. J. W. Monroe, sales engineer (l.) and M. W. Swor, plant manager, flank the unit.

TIME did not permit photographing products at all the more than 200 booths. If any exhibitor displayed a new item that was not photographed by the NEWS and which has not been covered in recent news stories, he is invited to submit a photograph and description.

If you're a man who takes pride in his work, you're a man who reads his businesspaper carefully. Cover to cover. Advertising as well as editorial pages. Why? Because—as a man who gets a kick out of doing a great job—you know there's no better place to get so many good, practical ideas you can put to work with extra profit to yourself, and your firm, than in . . . your businesspaper.

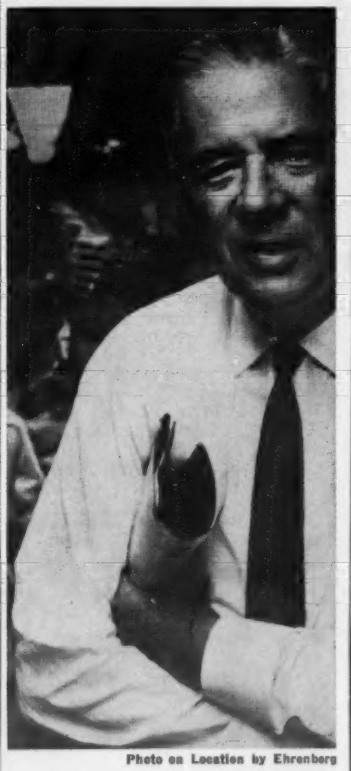


Photo on Location by Ehrenberg

Where there's business action, there's a businesspaper

. . . and where there's cooling and heating business, there's

AIR CONDITIONING, HEATING & REFRIGERATION NEWS

Rockefeller Seeks Mandatory Shelters--

(Continued from Page 1, Col. 2)
recommended and recently released by the New York State Committee on Fall-Out Protection. Accompanying this committe's report were plans for shelters prepared by a group of architects under a $100,000 grant from the Ford Foundation.

Under the Governor's legislative plan, shelters would be mandatory for all existing buildings by July 1, 1963, and for all structures started after Jan. 1, 1962. Among other things, minimum standards for shelter construction would be set.

The "Fall-Out" committee's research indicated that a small cellar unit for two persons could be built by a homeowner for $60 to $70, or by a contractor for $125 to $135. This type would be 6 ft. long, 5 ft. 5 in. wide, and 4 ft. high. A two-person cellar shelter built to ceiling height by a builder would cost $185 to $200.

Gov. Rockefeller is convinced that radioactive fall-out, in the event of war, threatened death or disability to every one of the 17,000,000 persons in the state. Fall-out shelters, he declared, offered the best single civilian defense measure.

It has been estimated that the shelter program would cost $1,500,000,000. The Governor's plan includes some tax concessions and low-cost state loans for persons who couldn't obtain financing. The plan was expected to run into considerable opposition in the Legislature.

In addition to this program, Gov. Rockefeller has also disclosed plans for an underground "alternate seat of government" for the state in the event of atomic attack.

The Governor said a $4,000,000 shelter would be constructed under the "campus site," about three miles west of downtown Albany, where all new state office buildings are now being built. This would be large enough for 640 key personnel.

Meanwhile, in Washington, D. C., the Atomic Energy Commission disclosed results of a test it conducted to determine the effectiveness of a modern concrete office building as protection against fall-out radiation. The test involved pumping a solution of Cobalt-60 through plastic hose girdling the AEC's headquarters building.

The experiment indicated that the best place to be was the basement, where the radiation was as little as one ten-thousandth of the outside level. The report warned, however, that the cellar can be "hotter," radioactively, than out of doors if roof drains or an air filtering system concentrate fall-out particles there.

Manufacturer Offers Shelter Equipped With Air Filter

NEW YORK CITY—Koven Fabricators, Inc., Dover, N. J., which makes home heating boilers, water heaters, and all-steel swimming pools, is now manufacturing atomic fall-out shelters for homeowners.

In a recent newspaper advertisement, the company said the shelters feature all-welded-steel construction and are equipped with "a special air filtering device to assure decontamination." The shelter will "comfortably accommodate a family of six," it was stated.

The price: $1,485 "ready to be installed in the ground."

Shoddy Heating Among Top Complaints--

(Continued from Page 1, Col. 4)
building and building materials fields for failing to sponsor national research programs to develop better home building methods and thus provide better housing.

Several of the "seven most glaring causes of dissatisfaction" have a relationship to the air conditioning and heating fields. These include:

"(1) Shoddy heating systems, which heat poorly, cause excessively high fuel bills, and wear out quickly. The heating system is a crucial part of houses. But most builders will cut corners and put in a cheap $600 job, say, that is good for about 10 years. For only 5 to 10% more in first cost they could install a unit good for 30 to 40 years which would heat more efficiently. . . .

"(2) Skimpy electric wiring. According to *House & Home,* "half of the homeowners in many large projects must spend nearly $100 within six months for additional electric service that the builder could have provided during construction for less than $20.

"(4) Token insulation, with the smallest permissible amounts spread over your ceiling and little or none used for the walls. If builders spent about $100 to $150 more per house for insulation, buyers would be assured of warm comfortable rooms during the worst cold weather. At the same time, the fuel savings that would result would pay for the extra cost within a few years."

The *Harper's* article said that in some ways, the builder is both a cause and the victim of a vicious system where incredible pressure is put on suppliers and contractors to cut their prices, and that where the builder gives in to pressure, quality must suffer. What homeowners should consider, it is pointed out, is that for a mere $100 added to yearly mortgage costs, most of the deficiencies in materials and construction could be eliminated.

Mass Production Could Cut Costs

Watkins says that much that is routine in building costs could be reduced by mass-production techniques. Possibly the biggest savings, he believes, might be in a "central utility core"—a compact centrally located cabinet which would combine all of the major mechanical, electrical, and other utilities of a house, and would include the heating and air conditioning system.

This utility core would be contained in a wall-like cabinet with various plug-in attachments, and might be mass-produced on factory assembly lines, and cut total house costs by 10 to 15%, says the article.

One of the problems of adopting the use of the utility core or any other new methods and materials are the conflicting and out-moded building codes. "If General Motors had to cope with such conditions its assembly lines would be forced to operate on a maddening stop-and-go schedule to accommodate model changes for individual dealers."

To those who say that a uniform national building code is an impossibility because of climatic and other differences in various parts of the country, Watkins points out that the new building requirements issued by FHA prove that one set of rules, with appropriate regional modifications, is possible.

2 Cures Suggested

The *Harper's* article says that two cures for many of the problems and dissatisfaction in present-day housing are:

A National Building Code Commission should be formed to work out a uniform building code for houses, as Canada is doing, with its acceptance by individual states being on a voluntary basis.

A National Housing Research Center should be established to do for housing what the National Bureau of Standards now does for government agencies and 16 branches of private industry. This Research Center, which Watkins says could be financed from FHA unspent surplus reserves, could carry out basic research on new methods and products, and set up quality standards.

THE WINNER! . . . .

DAVID C. CROW
The Dave Crow Co.
1402 Slocum St.
Dallas, Texas

David C. Crow, left, is shown here accepting congratulations and a new portable television set from William O'Reilly, district manager of the Mueller Brass Co. Dallas sales office, after being named the winner in the "Drops of Water" contest held at the recent 2nd Southwest Heating & Air Conditioning exposition in Dallas. Mr. Crow estimated that the "giant" briquette displayed at the Mueller Brass Co. booth could hold 37,501 drops of water. The correct figure was 37,515. Congratulations, Mr. Crow.

MUELLER BRASS CO.
PORT HURON 13, MICHIGAN

Proper Meat Cooling is provided by space-saving Krack Semi-Circular Unit Coolers that maintain correct temperature and humidity balance to prevent shrinkage.

Safe Dry Product Storage is provided by ceiling mounted Krack BUC Product Coolers that maintain a constant temperature.

Frozen Food Walk-in Coolers are kept at −10°F. temperature by trouble-free Krack lo-temp, hot gas defrost units.

Low Cost Air Conditioning is provided by ceiling mounted Krack Komfort Master air handling units that are "whisper quiet."

You can count on KRACK to deliver FULL-RATED CAPACITIES!

ADVANTAGES IN SPECIFYING KRACK EQUIPMENT

You can be sure of ratings and equipment that match the job. You gain advantage of lower bidding . . . no need to specify oversize equipment. You save installation and maintenance costs.

KRACK REFRIGERATION APPLIANCES, INC.

Manufacturers of Freon or Ammonia, Recirculated, Flooded or Direct Expansion Heat Transfer Equipment

MAIL COUPON FOR FREE BULLETIN 600

REFRIGERATION APPLIANCES, Inc., 901 W. Lake St., Chicago 7, Ill.

Name_____

Firm_____

Street_____ City_____ Zone____ State_____

0240

CLASSIFIED ADVERTISING

RATES for "Positions Wanted" $7.50 per insertion. Limit 50 words. 15¢ per word over 50.

RATES for all other classifications $10.00 per insertion. Limit 50 words. 20¢ per word over 50.

ADVERTISEMENTS set in usual classified style. Box addresses count as five words, other address by actual word count. Please send payment with order.

POSITIONS WANTED

REFRIGERATION AND air conditioning service or erection expert with 20 years' experience with York distributors desires change. Certified maintenance, inspector, service manager, expert on built up systems and large ammonia plants. Expert on controls, air balancing, and humidity control. Know the Freons as well as ammonia. Present travel territory all United States, wish to quit traveling. Would consider maintenance inspection or maintenance of refrigeration or air conditioning equipment of large industrial plant. Have been making $8,000.00 to $10,000.00 plus expenses. Will consider anywhere in U.S. if salary right and moving expenses included in deal. BOX A6478, Air Conditioning, Heating & Refrigeration News.

ARE YOU looking for a man who can . . . Sell almost anything? . . . Design and estimate from -40F to +75F (no heating)? . . . Supervise the erection of any type of system? A man who was . . . Never fired or laid off? . . . College educated? . . . Eleven years' refrigeration & air conditioning? BOX A6483, Air Conditioning, Heating & Refrigeration News.

REFRIGERATION AIR conditioning system designer & estimator. Thorough experience contract execution, field engineering, trouble shooting and sales. Familiar all sizes ammonia, Freon and associated equipment including centrifugal compressors and absorption plants. American citizen. Interested in position New York or vicinity. Write: BOX A6486, Air Conditioning, Heating & Refrigeration News.

I AM interested in permanent employment with a reputable company, as a service representative. I hold a technician certificate from a large state university, 3 years of college work, 8 years in refrigeration & air conditioning and construction service work. Write: BOX A6487. Air Conditioning, Heating & Refrigeration News.

POSITIONS AVAILABLE

SALES ENGINEER for air conditioning and heating contractor. Must be capable of handling established industrial accounts and developing new accounts from leads furnished. Experience with central station equipment desirable. Reason for open position is promotion of other personnel. Old aggressive company, fine reputation, all fringe benefits, long-term opportunity. Write or call E. H. Williams, THE HAUSMAN STEEL COMPANY, P. O. Box 416, Toledo, Ohio.

OPENING AT present time for a district manager with unlimited opportunity and earnings. Send complete resume to: Sales Department, SHERER-GILLETT COMPANY, Marshall, Michigan.

AIR CONDITIONING service manager qualified to take charge of growing service dept. Exceptional knowledge of controls, air balancing, refrigeration and heating components necessary. Must have experience in sales of service contracts and management. We are a medium sized air conditioning contractor with exclusive Carrier dealership. Send resume to THERMODYNE CORP., 1551 Coda Avenue, Long Beach 13, California.

SMALL MANUFACTURER of heat pumps (located in Los Angeles) has immediate opening for potential general manager. This position with a financially sound company represents a great challenge with commensurate salary opportunities. Write: BOX A6471, Air Conditioning, Heating & Refrigeration News.

SERVICEMAN TO cover Washington, Pennsylvania and Virginia area. Must be capable of supervision of installations, as well as emergency service of air cooled heating and air conditioning systems. Your home is your office. Send resume, salary desired, when ready to start to work for a progressive organization. BOX A6481, Air Conditioning, Heating & Refrigeration News.

SERVICEMAN FOR New York City firm. Experienced in commercial refrigeration and air conditioning. Also residential central systems. Must have qualified background plus ability to think and make decisions for himself. Steady, responsible job with a future at top pay. Send resume and recent snapshot to: BOX A6482, Air Conditioning, Heating & Refrigeration News.

DESIGN AND development engineers—Successful applicants will have an ME degree, will be 4 to 5 years out of college, with experience in air handlers phase of air conditioning industry or centrifugal refrigeration units and/or absorption systems. Excellent opportunity for young men with one of the industry's growth companies. Midwest location. Please submit complete resume to BOX A6485, Air Conditioning, Heating & Refrigeration News.

CINCINNATI AREA — Wholesaler of refrigeration, air conditioning, heating equipment and supplies, needs an experienced counter and outside salesman. Please send resume to BOX A6488, Air Conditioning, Heating & Refrigeration News.

EQUIPMENT WANTED

WANTED: MANUFACTURERS surplus, outdated or obsolete refrigeration items—expansion & water & shut-off valves, controls, relays, dehydrators, units, tubing, fittings, etc. All sales on a cash closeout basis, large or small quantity. Write or call: COMMERCIAL CONTROLS CO., 257 East 3rd Street, New York 9, New York, ORegon 3-7210.

EQUIPMENT FOR SALE

CHILLED AND hot water or direct expansion extended surface coils: 5 T.-4R—4 sq.ft. face area $117.00; 7.5 T.-4R—6 sq.ft. face area $149.00; 10 T.-4R—8 sq.ft. face area $181.00; 15 T.-4R—12 sq.ft. face area $245.00; 20 T.-4R—16 sq.ft. face area $310.00; 25 T.-4R—20 sq.ft. face area $375.00; 30 T.-4R—24 sq.ft. face area $440.00: Capacity based upon 45°R.T. & 67°E.A. w.b. 500 fpm coil face velocity. Wire • write • call for quotations for any coil requirements, ARCTICAIRE MFG. CO., 2201 Grand Ave., Tel. BA. 1-7055 Kansas City 8, Mo.

SEALED UNITS Re-manufactured equal to new all makes domestic and commercial. One year guarantee against defective workmanship and material. Send for free terminal color guide and dome exchange chart. Price list included. Some territory still open for distributors. BONDED HERMETIC RE-MANUFACTURING CO., INC., 608 Coney Island Ave., Brooklyn, N. Y., GEdney 5-8680.

DEALERS, DISTRIBUTORS, agents—Remote air cooled - air conditioning Heat pumps that defrost without reversing without loss of efficiency (patent applied for). High quality, competitive pricing. Some territory in North, East, and far West open—dealers anywhere. NATIONAL THERMATIC CORPORATION, Division of JOHN FELTER COMPANY, P. O. Box 7464, Houston, Texas.

REFRIGERANT CYLINDER stands—now better and cheaper than ever. See your local wholesaler. If he does not have them in stock at present write SPENCER REFRIGERATION SERVICE, Martinsville, Virginia.

ATTENTION REFRIGERATION Servicemen: Send for catalog listing values in refrigeration and air conditioning parts, relays, capacitors, compressors. Savings up to 50%. WALTER W. STARR, 2833 Lincoln Ave., Chicago 13, Illinois.

THERMOSTATIC EXPANSION valve —Europe's best—½-1 ton F-12 now available stocked in U.S. Immediate delivery for manufacturers, contractors, territories open for representatives, wholesalers, 1 year guarantee, small, efficient, reliable—priced under market. Write BOX A6479, Air Conditioning, Heating & Refrigeration News.

BUSINESS OPPORTUNITIES

DISTRIBUTORS WANTED. New, proven temperature warning alarm . . . sold to super markets, chains, restaurants . . . every store using refrigeration. Simple to install—virtually no maintenance. Real money saver—quick sales . . . satisfactory profits for distributors. Send for our proposition. RICHMOND REFRIGERATION CO., 765 Post Ave., Staten Island 10, New York.

WELL ESTABLISHED New York City air conditioning and refrigeration mechanical contractor — industrial and commercial — desires partner to buy one-half interest. Field working knowledge and good sales ability necessary. Investment five figures. Write: BOX A6466, Air Conditioning, Heating & Refrigeration News.

PLACED on an end table, Whirlpool Corp.'s new remote control room air conditioner enables the user to adjust cooling temperature, air direction and volume, and exhaust without leaving the chair. The unit can be installed in the bottom of windows as shown here, or, for the first time, conveniently at the top, since in no event is it necessary to go near the unit except to inspect or change the filter.

CLOSEUP of Whirlpool remote control panel.

Whirlpool Remote Control Room Unit--

(Concluded from page 1)

and 230-volt sizes. None carry suggested list pricings.

Operation of the new Custom unit is entirely by remote control. The brushed-chrome control panel, placed on an end table or night stand, enables the user to adjust cooling or heating temperatures, air direction and volume, and exhaust without living chair or bed.

For the business or professional office, Larkin said, remote control air conditioning means uninterrupted business discussions, without moving from the desk. This convenience, he continued, also has the same obvious advantages for shut-ins and for the hospitalized.

Can Be Conveniently Installed In Window Top

The unit can be installed in the bottom of windows, currently the customary location, and now, for the first time, conveniently at the top, Larkin explained, since in no event is it necessary to go near the unit except to inspect or change the filter.

Truer room temperature control is provided with the new unit, Larkin said, by placement of the thermostat inside the remote control panel rather than in the air conditioner. This means, he said, temperature is now controlled from where the user is located rather than where the air conditioner is installed.

A marked departure from the design of other RCA Whirlpool room coolers has accompanied development of Whirlpool's new remote control unit, particularly on the front of the cooler where two sets of louvers are now employed to direct air flow.

Also, three signal lights located left of the louvers indicate at a glance when the unit is turned on (red); when it is cooling (blue); and when stale air is being exhausted from the room (white).

Remote Control Unit Operation Described

Three knobs conveniently located across the lower half of the control panel activate the air conditioner for either cooling or heating; set the thermostat at "cool" or "warm" settings; and control the volume of air intake. All three controls have infinite settings.

A panel of three switches in the upper right corner of the control box can be set to exhaust air from the room, and to adjust air direction and circulation. By pushing the left switch, the exhaust door opens electrically and remains at that position until the switch is pushed to the "closed" position.

Horizontal air movement is controlled by pushing the center switch. Held in the "adjust" position, this switch activates a small motor located inside the chassis which moves the horizontal air direction louver to the position desired. The louver stops when pressure is relieved from this position.

By pushing the same switch to "sweep," the louver oscillates to provide full horizontal air movement into the room. Vertical air movement is accomplished by manipulating the third switch in the same way.

For full 360° oscillation, the user need only push both switches to "sweep" position.

In spite of the fact that the controls are remote, operation is "very easy to understand and the controls themselves operate with a feather-light touch," it was stated.

Both the new remote control custom models and deluxe units have specially designed silencing chamber and spring and rubber mounted compressor for extremely quiet operation, Larkin said. Tests in Whirlpool laboratories, he said, have demonstrated that the highest sound pitch in the new 1960 room cooler line is well below the lowest level of previous RCA Whirlpool models.

Larkin continued: "The sturdy, pull-out chassis is reinforced to provide a rigid box-like structure, and for the custom line all steel parts exposed to outdoor elements have been galvanized as additional protection against the deteriorating effects of weather. All condensate is routed into special non-deteriorating plastic pans rather than depressions in the base of the chassis.

"A special system," Larkin noted, "eliminates outside dripping from the chassis even on the most humid days. All tubing and wiring have been specially bracketed and supported to prevent wear over long periods."

Cabinets in both the remote control Custom models and the new deluxe units are cloud gray in color. The Custom unit has chrome and charcoal gray trimming; the Deluxe is trimmed in dark gray.

Specifications

Following are specifications for both units:

Size	Model	Voltage	Amps.
1 hp.	Custom	115	7.5
1 hp.	Custom	115	12.0
1 hp.	Custom	230	7.0
1 hp.	Custom	230	8.9
2 hp.	Custom	230	12.0
2¼ hp.	Custom	230	12.0
1 hp.	Custom	230	7.8
2 hp.	Custom	230	12.0
1 hp.	Custom	115	12.0
1 hp.	Custom	230	7.8
1 hp.	Deluxe	115	7.5
1 hp.	Deluxe	115	12.0
1 hp.	Deluxe	230	7.0
2 hp.	Deluxe	230	12.0
1 hp.	Deluxe	230	7.0

Larkin believes the appearance of remote control room air conditioners will provide new merchandising avenues.

"For one thing," he said, "our remote control unit provides the dealer with the perfect opening to inaugurate *step-down* selling to the unit within reach of the consumer's pocket."

Possibly of even greater significance to the dealer is the opportunity for "something different" in demonstrations, he indicated, adding: "His customers can easily—and we have discovered—are highly eager to demonstrate the remote control unit for themselves."

WATER COOLER

10 GALLON PRESSURE TYPE

$139.50*

*To DEALERS ONLY

• STURDY • ECONOMICAL
• STAINLESS STEEL DRAIN TOP
• NICKEL FINISHED COPPER COOLING TANK
• ⅓ H.P. TECUMSEH HERMETIC UNIT
• PRE-COOLER
• 5-YEAR WARRANTY ON REFRIGERATION CYCLE

REMCOR Model CW-10A

Also 5 gallon Bottle Water Cooler—*$89.50

REMCOR PRODUCTS COMPANY
321 EAST GRAND AVENUE,
CHICAGO 11, ILLINOIS
manufacturers of water coolers since 1940

Alfred W. Mellowes, Refrigeration Pioneer, Buried In Milwaukee

DAYTON — Funeral services for Alfred W. Mellowes, 80, former Daytonian who built the Guardian refrigerator, were held recently in Milwaukee.

The Guardian was the ancestor of today's Frigidaire refrigerator.

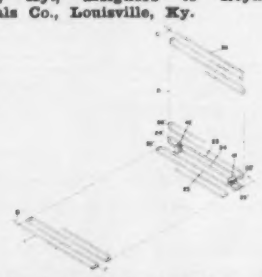
His first venture into the refrigeration business was with the Johns-Manville Co. in 1911-15. Later, he and an assistant, working in Fort Wayne, Ind., built a refrigerating unit and installed it in a wooden ice box cabinet.

With others, he formed the Guardian Frigerator Co. which was purchased by W. C. Durant in 1918. The next year, Durant sold the company to G.M.

PATENTS

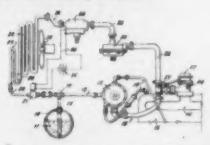
Week of Oct. 13

2,908,070. METHOD OF MAKING SERPENTINE TUBE FINNED HEAT EXCHANGER AND PRODUCT. Jesse B. Thomas and Edwin H. Wolff, Louisville, Ky., assignors to Reynolds Metals Co., Louisville, Ky.



1. In the method of making a heat exchanger or the like from a serpentine tubing having a series of straight runs extending longitudinally between its front and rear ends and connected serially at said ends by return bends, the steps comprising. . . .

2,908,143. COMBINED AIR CONDITIONER AND FUEL SYSTEMS FOR AUTOMOTIVE VEHICLES. George A. Price, St. Francis, Kan.

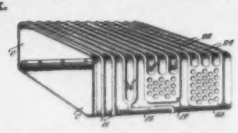


1. A combined air conditioning unit and fuel supply for the engine of an automotive vehicle comprising: a liquid petroleum gas container; an evaporator coil; an expansion valve; a liquid conduit conducting petroleum gas in the liquid phase from said container to said evaporator coil through said expansion valve to expand said gas to a vapor phase within said evaporator coil to chill the latter; means for forcing the air to be conditioned into heat exchange relation with said evaporator coil for conditioning said air. . . .

2,908,146. FREEZING DEVICE POWER UNIT. Arthur J. Prei, Dayton, Ohio, assignor to General Motors Corp., Detroit, Mich.

1. An ice motor for a freezing device of the character including a tray and a grid therein having a plurality of relatively movable partitions dividing the interior of the tray into compartments in which water is to be frozen into separated ice blocks, said motor comprising reaction elements forced to move relative to one another at a predetermined temperature below the temperature at which water in the device freezes for reacting between partitions of the grid to move them. . . .

2,908,147. ROOM AIR CONDITIONING APPARATUS HAVING FILTER ARRANGEMENT FOR INDEPENDENT OPERATION. James H. Powers, Middletown, Ky., assignor to General Electric Co., a corporation of New York.

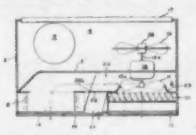


1. In a room air conditioning unit having an evaporator arranged within an inner compartment, the combination comprising air moving means in said inner compartment for circulating a stream of air from inside a room over said evaporator, said air moving means being disposed upstream from said evaporator, a filter disposed across the path of said air stream circulated through said inner compartment, air bypass means in said inner compartment having an opening arranged upstream from said evaporator and downstream from said filter. . . .

2,908,148. ICE BLOCK EJECTOR. Verlos G. Sharpe, Dayton, Ohio, assignor to General Motors Corp., Detroit, Mich.

1. In combination, a freezing device receiving element having an open bottom support thereon, a freezing device containing a plurality of ice blocks bonded therein placeable in an inverted supported position on the support of said element, a stop cooperating with the support on said element holding the invertedly supported freezing device stationary thereon. . . .

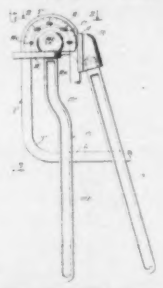
2,908,149. EVAPORATORS FOR REFRIGERATION. James A. Hall, Detroit, Mich., assignor to Reynolds Metals Co., Richmond, Va.



1. A refrigeration evaporator comprising: a hollow structure open at the front and composed of a passageway panel constructed of at least two superposed metal sheets bonded together in face-to-face relationship and having a bulged refrigerant-passageway system of unwelded areas between them including accumulator means; said structure having a top wall, opposite side walls integral with said top wall and a bottom wall. . . .

2,908,193. MANUAL TUBE BENDER. Julius Gryniewicz, Dearborn, Mich., assignor to The Imperial Brass Mfg. Co.

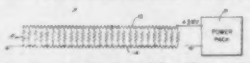
2. In a manual tube bender having a mandrel having an axis and provided with a peripheral bending groove having a root lying in a transaxial plane, a bending shoe arranged to form with the mandrel groove a tube receiving



space, an arm pivotally secured to the mandrel at said axis and extending parallel to said plane on one side of the mandrel and carrying said shoe at its outer end to move circumjacent the mandrel groove, and a handle secured to the shoe to have its axis move in a plane parallel to said transaxial plane and on the opposite side of said mandrel.

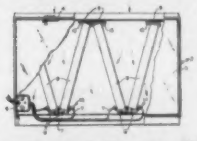
2,908,347. ELECTROSTATIC PRECIPITATORS. William J. Roos, Sharon, Mass., assignor to Westinghouse Electric Corp., East Pittsburgh, Pa.

8. In an electrostatic precipitator having a high voltage D.C. power pack with positive and negative output terminals, the combination of a collector cell comprising a mat of non-conductive filaments, means for electrostatically charging said mat comprising screen-shaped distributed isolating re-



sistors in contact with the opposite sides of the mat. . . .

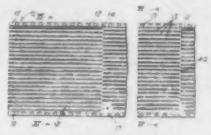
2,908,348. ELECTROSTATIC AIR FILTER. Richard D. Rivers and Deloss H. Robb, Louisville, Ky., assignors to American Air Filter Co., Inc., Louisville, Ky.



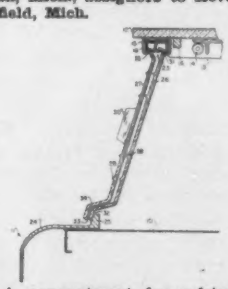
1. An electrostatic air filter comprising: a cell housing having spaced opposed guide channels mounted on the inner walls thereof. . . .

2,908,350. FILTER ELEMENTS. Kenneth Ernest Buckman, Redbridge, Southampton, England, assignor to General Motors Corp., Detroit, Mich.

A filter element comprising an elongated web or filter material transversely folded in a zigzag arrangement of superposed and corrugated sections joined by oppositely disposed folds, each corrugated section having ridges extending along the length of said web normal to said folds and forming channels located between adjacent sections and defined by the ridges of one section contacting the web portion of an adjacent section. . . .



2,908,539. COMPARTMENTS FOR REFRIGERATORS. Howard D. White, Deerfield, and Howard J. Tenniswood, Adrian, Mich., assignors to Revco, Inc., Deerfield, Mich.



1. A compartment for refrigerators, said compartment having a front opening, an inverted channel extending transversely over said front opening, a pair of walls of said channel extending downward. . . .

AIR ENGINEERING . . .

a monthly magazine for Air Engineers

Covering the art and science of managing air to make it useful and helpful for man in structures and manufacturing processes.

FOUNDED: April, 1959
RECORD TO DATE: Circulation—5600 Paid—10,000 Guaranteed
ADVERTISING: 49 Advertisers
ADVERTISERS: from American Standard to Koppers to York
PRODUCTS: from Air Conditioners to Filters to Ventilators

For complete information—

Ask your nearest AIR ENGINEERING representative for a Market and Media File Folder or write direct for detailed information.

NEW YORK: 521 Fifth Ave., MU. 2-1928
LOS ANGELES: 4710 Crenshaw Blvd., AX. 2-9501
CHICAGO: 134 S. LaSalle St., FR. 2-8643
DETROIT: 450 W. Fort St., WO. 2-0924

BUSINESS NEWS PUBLISHING CO.

Publishers of "Air Conditioning, Heating & Refrigeration News"

Manufacturers Seek ARW Membership--

(Continued from Page 1, Col. 5)

April 15. By that time we will have a fair idea of how many and who the associate members will be for 1960.

Letter to Manufacturers

Miessemer's letter to manufacturers said, in part:

"The year 1960 represents an important year for ARW. It is our 25th year of member association. During these 25 years, we have taken an important position in the refrigeration and air conditioning industry. This has taken place because manufacturers such as yourself, find that you can move your goods to market more economically and readily by using the independent wholesaler. And the trade in the industry depends on the service we render.

"We feel that 1960 is the start of a challenging new era. The industry that you and we serve will be faced with new problems, new conditions, and new opportunities. We feel confident that there will be growth. Yet how fast we grow and how well we grow will depend on our ability to meet and solve the problems we face.

Face Common Problems

"The marketing problems you face as a manufacturer are for the most part, the same problems we face, since we represent you as your selling arm to the trade. Questions such as inventory requirements by markets, capital needed, space required, salesmen necessary, and promotional activity are common problems.

"Since we so strongly feel that these are common problems, the members of ARW, by unanimous vote, have amended our constitution so that component manufacturers in our industry who qualify, can join with us as associate members. All the rights and privileges of the association are extended to associate members with the exception of voting.

"This decision to open the association to associate members is not to be construed as a reflection on our past relations with you or any other association to which you may belong. However, many other industry associations, similar to ours, have found it practical and beneficial to include manufacturers as associates.

Benefits of Associate Membership

"As an associate member, you will receive identification in our directory, be furnished with a membership certificate, permitted to use identifying materials of ARW, receive all bulletins and mailings of the association, and other programs that will be prepared for use by members and associates.

"It is proposed that marketing committees by product be established. The membership of these committees will be composed of associate and wholesaler members. The membership initiation fee has been eliminated for associate members. The dues structure has been set at the lowest full member level of $125 per year."

In a further comment on the move, Miessemer said that "apparently there have been misconceptions on the part of some manufacturers as to why we made this move.

"First of all, we understand that there is a feeling that this is a revenue raising program that has been instigated following our decision to drop the *ARW Journal*. We should like to point out that our members voted approval of this program a number of months before we decided to drop the *Journal*.

"As to the revenue derived from associate membership, anyone acquainted with association work will realize that the cost to service these new members in the program outlined will mean a stand-off in cost versus income. In the matter of dollars and cents, the associate member program will produce about 8% of our total estimated income.

"The question of the legality of such a move has been raised. We naturally checked this through legal counsel and cleared it from all angles. If a manufacturer has a policy that prohibits the firm from joining our association, or feels that there are legal complications, then certainly we can understand his hesitancy to join.

"The association office will continue to serve all supplier manufacturers in those problems that demand association work, whether or not the manufacturer is an associate member.

"We believe that the growth of this industry demands greater understanding of the marketing problems that face us today and tomorrow. Those manufacturers who use the wholesaler to serve the trade have a common problem with us in solving these problems. In this belief, we feel that we can best solve many of these problems through association activity, in combination with the wholesaler and manufacturer. This above all, is our reason for making this move."

1959 Refrigerator Sales Estimated at 3,785,000 Units

NEW YORK CITY—The National Electrical Manufacturers Association has estimated that total industry sales of electric household refrigerators in 1959 reached 3,785,000, compared with 3,116,700 in 1958.

Farm and home freezer sales last year amounted to 1,205,400, against 1,100,900 in 1958, according to NEMA.

The figures are based on expansion of data reported to the NEMA Statistical Dept. to cover total industry sales including exports.

Toronto Licensing--

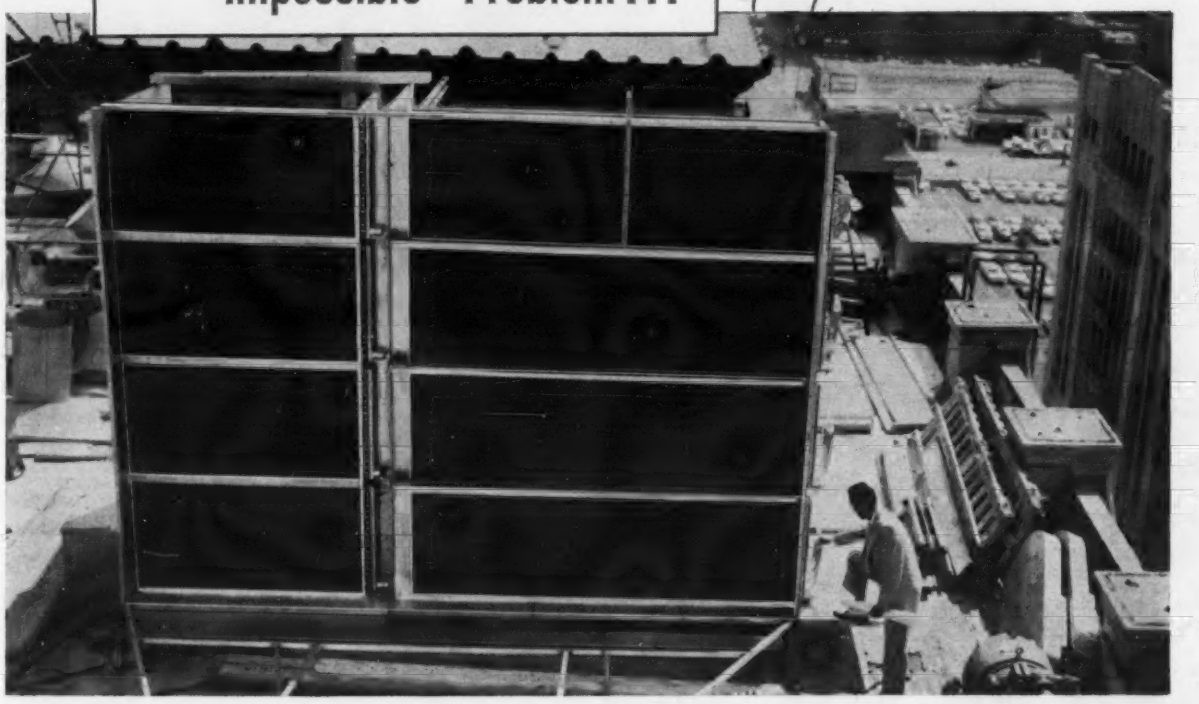
(Continued from Page 1, Col. 3)

"Sub-standard heating installers who have flagrantly flaunted the good heating practices laid down by the industry and who have continuously misused the buying public must be brought under the jurisdiction of the law.

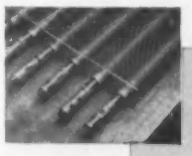
"Municipal legislation with a stiff penalty to every company that contravenes any of the provisions of the by-law is the only method that the substandard installer will ever understand or will want to understand."

As another means of beating the "heating hucksters," the association recently decided to ask every municipality within 50 miles of Toronto to adopt the Toronto heating by-law. The councils will be told of the protection the by-law will offer the public.

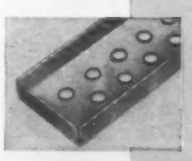
Here, SPACE posed the "Impossible" Problem... until



A DUNHAM-BUSH ROOFTOP INSTALLATION MADE AIR CONDITIONING POSSIBLE



FINS—All coils are fabricated with a specially designed serrated aluminum fin having an extended collar which ensures a tight bond and high heat transfer.



CASINGS—(Tube Sheets and Top and Bottom Plates)—Of heavy gauge zinc coated steel, and provided with a 1½" flange having 5/16" holes spaced on 3" centers for ease in duct connection.

HEADERS—Of heavy seamless copper construction having die-formed lipped holes to provide greater welding surface and bearing area between tubes and header.

All non-freeze steam coils are of the heated header type—steam is supplied and condensate returns through the same header. Connections are on the same end, thus simplifying the piping problem.

It had been thought impossible to properly air condition this 13 story building (Quimby Building, Los Angeles). A central system was required, but there just wasn't enough space anywhere in the building to install the equipment necessary to handle the load of approximately 200 tons.

Using the roof area as a "machine room" proved the answer. Four Dunham-Bush direct expansion coils (each 36" high by 120" long) and four steam heating coils (each 36" by 72") form a 12 foot by 16 foot bank. Each six row direct expansion coil was specially engineered into sections 2 and 4 rows in depth. This permitted precise control of conditions in all zones. The coils serve 212 zones within the building.

Next time *you* have an "impossible" job, check with your Dunham-Bush sales engineer. He's a man with the experience—and broad product line—to help you find a sensible solution.

Dunham-Bush, Inc.

WEST HARTFORD 10 • CONNECTICUT • U. S. A.

DUNHAM-BUSH

AIR CONDITIONING • REFRIGERATION • HEATING • HEAT TRANSFER

WEST HARTFORD, CONNECTICUT • MICHIGAN CITY, INDIANA
MARSHALLTOWN, IOWA • RIVERSIDE, CALIFORNIA
SUBSIDIARIES
heat x HEAT-X, INC. EDMONTON, ALTA. DUNHAM-BUSH (CANADA), LTD. TORONTO, CANADA
DUNHAM-BUSH, LTD. PORTSMOUTH, ENGLAND REFRIGERATION CORPORATION (CANADA) LTD. PORT HOPE, ONTARIO